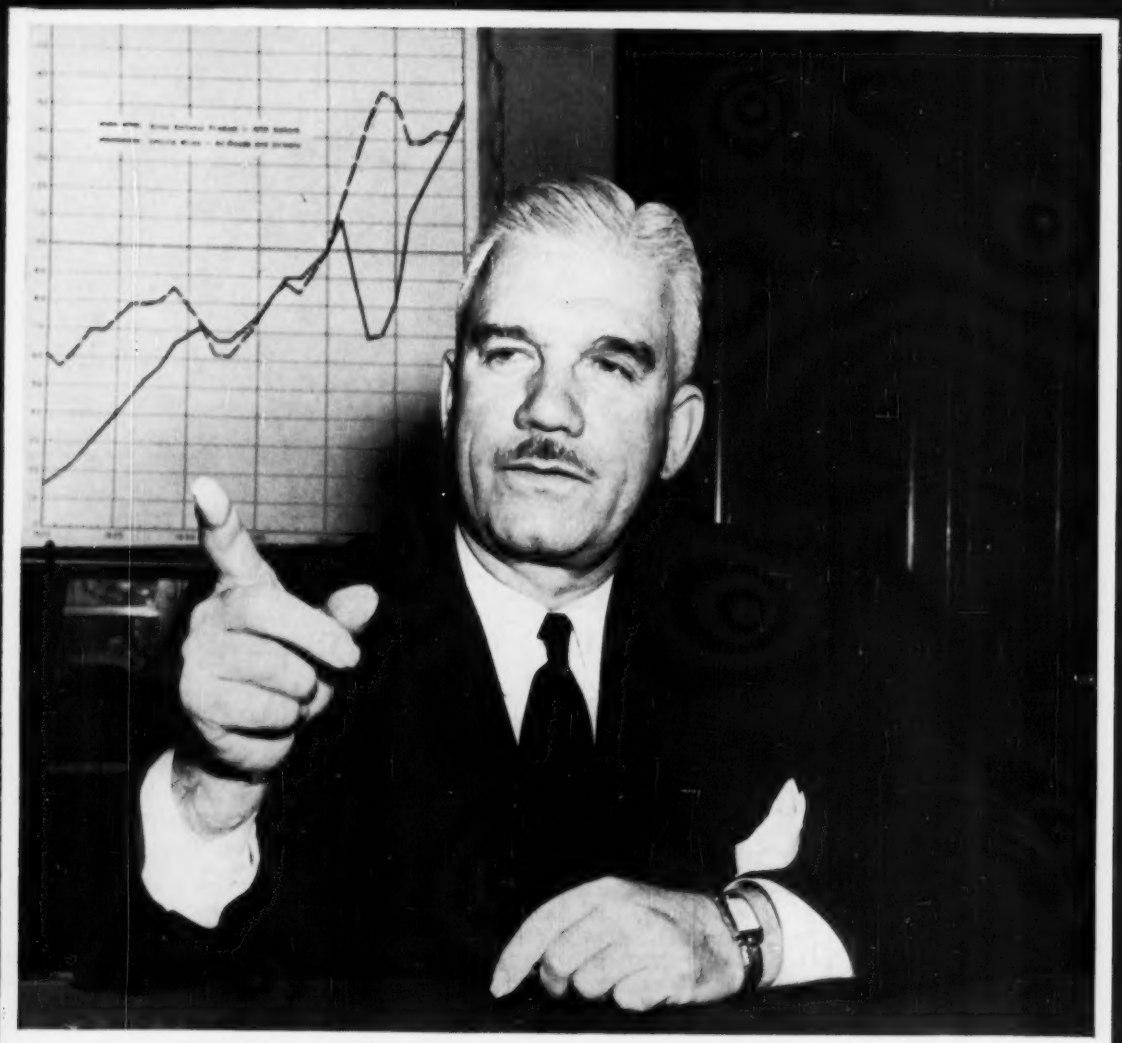
ENGINEERING NEWS-RECORD



Bertram D. Tallamy: Taskmaster for New York's Thruway *p. 49*

E B POWER GS 1
UNIVERSITY MICROFILMS IN
313 N 1 ST
ANN ARBOR MICH

A McGRAW-HILL PUBLICATION

Giant Wrought Iron intake-discharge lines carry Mississippi River water to the Bayou Lafourche

There are plenty of service life hazards confronting these water lines. From the pumping station at Donaldsonville, La., to the Bayou Lafourche head waters, these lines dip into the ground for long stretches, run under highways and gravelled streets. And all along the way, they transport Mississippi River water.

Small wonder, then, that the engineers of the Department of Public Works, State of Louisiana, took special care in selecting a material that would provide maximum durability.

This thorough investigation of the hazards, plus the desire to eliminate the additional costs of special protective coatings and wrappings, led to the use of wrought iron plate. More than 394 tons of this time-tested material was fabricated into 60-inch and 48-inch lines for intake and discharge line service.

Some of the intake lines were floated to the site of the installation from the shipyard of Avondale Marine Ways, Inc. The discharge lines, welded by Cal-Metal Pipe Corp. of Louisiana, were delivered by truck and pole trailer.

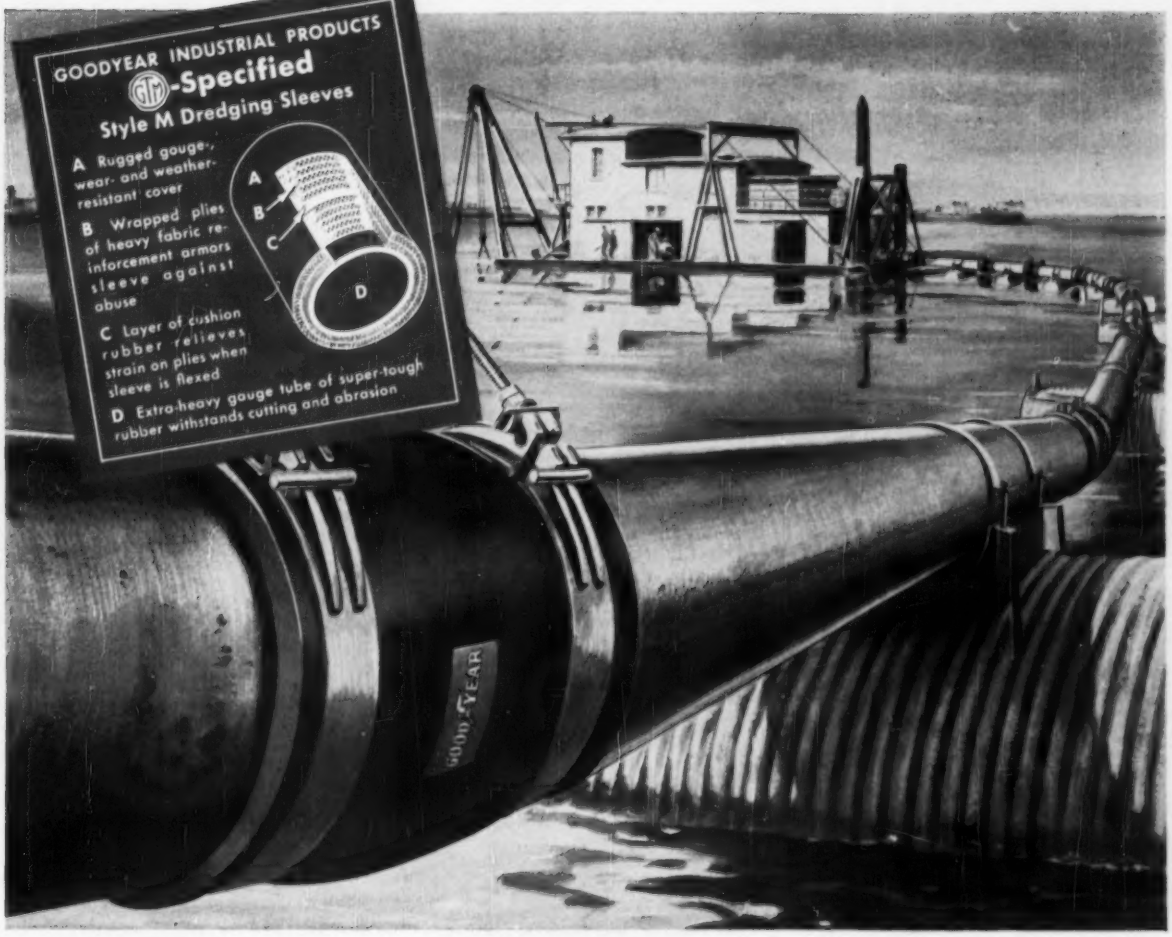
Write for our bulletin, *Wrought Iron for Underground Services.*

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. International Division: New York, N. Y.

Available in Canada and throughout the world

BYERS *Wrought Iron Tubular and Hot Rolled Products*

ALSO ELECTRIC FURNACE QUALITY STEEL PRODUCTS


GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
Style M Dredging Sleeves
A Rugged gouge-, wear- and weather-resistant cover
B Wrapped plies of heavy fabric reinforcement armors sleeve against abuse
C Layer of cushion rubber relieves strain on plies when sleeve is flexed
D Extra-heavy gauge tube of super-tough rubber withstands cutting and abrasion
A
B
C
D
GOODYEAR

Look what's up the G.T.M.'s sleeve, now!

IT's a razor-sharp coral rock! The kind that's used as aggregate in asphaltic road mixes.

In the operation pictured above, this rough, abrasive rock posed a real problem. It quickly chewed through every kind of dredging sleeve tried. Some of these flexible, rubber links between the metal pipe of the pontoon line *lasted less than 10 hours*. Average service was *only one month*. That is, until the G.T.M.—Goodyear Technical Man—stepped into the picture.

The G.T.M. recommended specifically developed Style M Dredging Sleeves. These hand-built combinations of special rubber compounds and reinforcing fabric were made to order for the job—serve an average of six months—six times previous service. For details on these durable sleeves, or any of the more than 800 types of hose available from the G.T.M., see your Goodyear Distributor or write Goodyear, Industrial Products Division, Akron 16, Ohio.

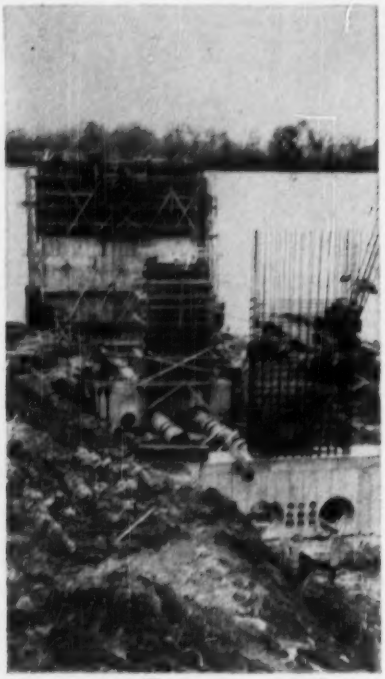
It's smart to do business with your Goodyear Distributor. *He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

STYLE M DREDGING SLEEVES by

GOODYEAR

THE GREATEST NAME IN RUBBER

Symons FIELD REPORT...



Symons Forms used on Ohio River Intake Job . . .

60,000 square feet of concrete forming went into this job constructed for the city of Henderson, Kentucky. The wall started at elevation 317 (sea level elevation) or 21 feet below the river pool stage and when completed was topped at 385 or 47 feet above the water.

15,000 square feet of Standard Symons Wood Frame Forms were used, in sizes 2′ x 4′, 2′ x 6′ and 2′ x 8′.

George Ryan, Vice President said, "Even in the eight foot lengths our Symons Forms are easily carried by one man. Another feature which we have found helpful is the ease of removing a panel at any place in a wall to clean keyways and straighten reinforcing steel. This has saved us a lot of time."

Three piers for an all access bridge to the intake structure were also formed with Symons Forms. Part of the project involved an extension of the Henderson power plant.

Symons Forms can be rented with purchase option, all rentals to apply on purchase price. Symons Clamp & Mfg. Co., 4265 Diversey Avenue, Dept. F-6, Chicago 39, Illinois.

Roy Ryan Sons Company, Inc., Evansville, Indiana
General Contractor

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EIGHTY-SECOND YEAR OF PUBLICATION

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NUMBER 13

NORTHWEST Rigs carrying the name of Poirier & McLane of New York, have been seen on New York and New England jobs for many years. Over a long period of time Poirier & McLane have added to their fleet of Northwests as their business grew—*and their business grew each year, as their Northwest fleet grew.*

Year after year successful contractors, both large and small, continue to make one out of every three Northwests sold a repeat order. Here is the best possible guarantee that Northwests make money for their owners. But, more than that, it is a guarantee that Northwest leadership in design, quality and performance has been maintained in advance of other similar equipment.

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for
POIRIER & McLANE,
New York,
helps start the
CONNECTICUT TURNPIKE!

One of the more than 30 Northwests already on the Connecticut Turnpike.

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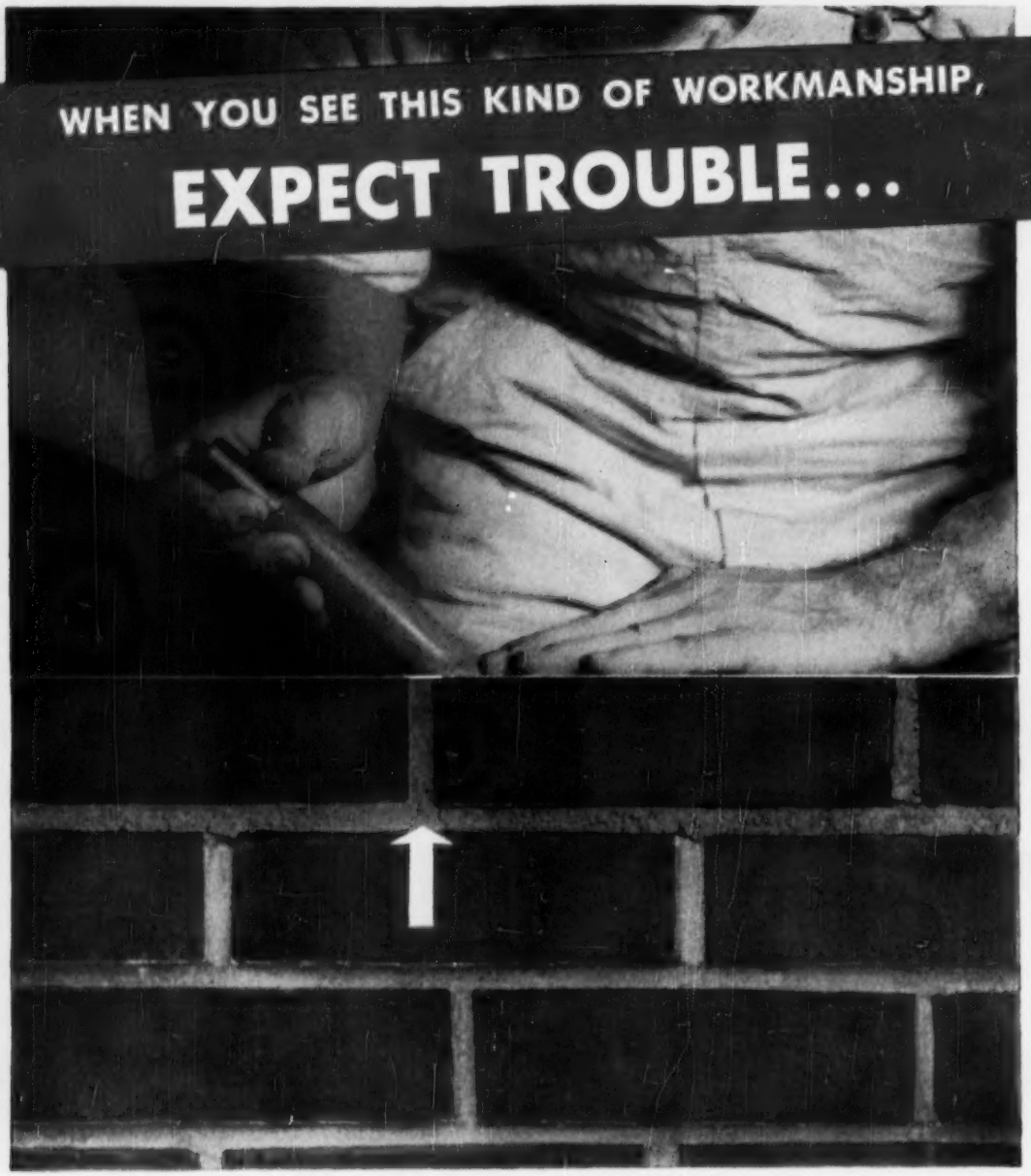
NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

WHEN YOU SEE THIS KIND OF WORKMANSHIP,

EXPECT TROUBLE...



GOOD workmanship is one of the most important factors in preventing leaky brick walls.

Good workmanship includes wetting the brick, securing full head and bed joints, backplastering the face brick—*and laying the brick carefully to keep the bond. The position of the brick should never be shifted after the mortar has stiffened.*

Expect trouble when brick are shifted or tapped into place after the mortar has stiffened. Cracks will result and the wall may leak.

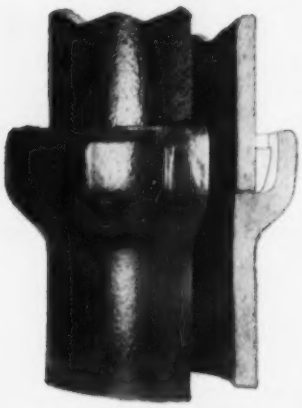
Brixment mortar has high water-retaining capacity. It resists the sucking action of the brick. It stays plastic and workable longer. Brixment mortar therefore makes it easy for the bricklayer to lay the brick accurately, before the mortar has stiffened.

Brixment mortar has great plasticity, high water-retaining capacity and bonding quality, great resistance to freezing and thawing, and freedom from efflorescence. Because of this *combination* of advantages, Brixment is the leading masonry cement on the market.

BRIXMENT

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

AMVIT* JOINTED CLAY PIPE gains wide acceptance, more than 60 major installations completed in 1955



Never before has a new product gained such wide acceptance and usage in such a short period of time.

In the first year since Amvit Jointed Clay Pipe was introduced more than 60 major installations have been completed with outstanding results. Such pioneer cities as Dayton, Ohio, Camden, New Jersey, Ostego, Michigan, Victor, New York, have installed their second and third Amvit Jointed sanitary lines.

Prevents Infiltration

Field tests from these installations show that ground water infiltration can be controlled and prevented—thus reducing pumping and treatment plant costs. Amvit is a compression type joint on the ball and socket principle. Nothing can enter the line after it is complete.

Quick Installation Saves Labor

Since no other material such as caulking, joint compound, hot-pots or ladles are needed to make the Amvit Joint, installation is quick and easy. The joint is on the pipe delivered to the job ready to use. Savings with Amvit Jointed Clay Pipe mean *lower cost of pipe in place* when the line must meet a rigid test.

Amvit Jointed Clay Pipe, in sizes 4" through 24", together with all fittings is available for immediate delivery in the Northeast and Central States.

For more information, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.

Indiana

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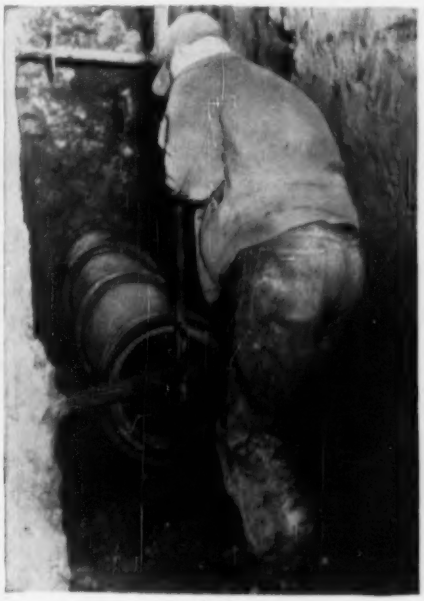

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American Vitrified Products Company

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MANUFACTURERS of: Clay pipe, flue liners, clay liner plates and concrete pipe.

Plants Across the Nation...Brazil, Indiana • Chicago, Illinois • Cleveland, Ohio • Crawfordsville, Indiana • Detroit, Michigan • East Liverpool, Ohio Fenton, Michigan • Grand Ledge, Michigan • Lisbon, Ohio • Los Angeles, California • Milwaukee, Wisconsin • South Bend, Indiana • Uhrichsville, Ohio

THE NEW LORAIN-56

Here's the newest 1¼-yd. shovel-crane, the Lorain-56—and it has *all* the newest, most advanced features combined into one machine. 2-Lever, "Metered-Air" controls . . . "Shear-Ball" mounting . . . torque converter . . . and many, many other *standard* features are included. Operators will like its simple, easy operation and freedom from adjustments. Owners will find the resulting higher production profitable. A few of these outstanding features are described briefly below. Get the *full* Lorain-56 story from your Thew-Lorain Distributor now!

ALL OF THESE FEATURES (AND MANY MORE) ARE STANDARD

"SHEAR-BALL" MOUNTING

No center pin or nut, no rollers to wear. No adjustments! Provides smooth, rock-steady, "ball bearing" swing. Nothing else like it on any other make of shovel-crane.

SQUARE-TUBULAR-CHORD CRANE BOOM

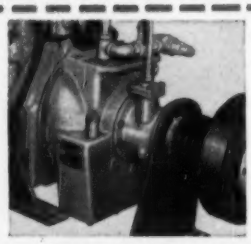
Lighter! Longer! Stronger! New, patent-applied-for design gives greater strength, less weight. Permits increased lifting capacities and working with longer booms.

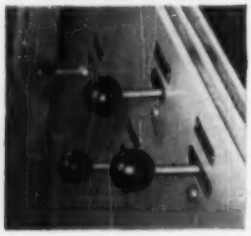
REMOVABLE COUNTERWEIGHT

New design makes it possible to detach counterweight easily for lower weight when transporting this new Lorain over the highway. Can be removed or installed in minutes.

TORQUE CONVERTER

Smoothest, most productive power take-off. Multiplies engine torque — absorbs digging shocks. "No-stall" power hangs on — maximum work from the diesel engine.





AIR CONTROL OF CRAWLER

Now — air does the work. Controls travel, steering, tread lock, swing-travel jaw clutches. Far greater ease of operation. Adds greatly to production.

ANTI-FRICTION BEARINGS

Now, anti-friction bearings on hoist and swing drums and travel shaft provide the ultimate in performance . . . smoother, more efficient.

Ask your Thew-Lorain Distributor for full details on this NEW machine!

A FULLY AIR-CONTROLLED 1¼-yd. MACHINE

INTERCHANGEABLE FRONT ENDS

Illustration above shows the new Lorain-56 Hoe, combining all of the standard features, plus a 23 ft. long gooseneck boom and 7 ft. dipper stick, for maximum digging depth. Dippers available in 5 widths of 36" to 48". Other front ends include crane boom with dragline and clamshell conversions.

2-LEVER, "METERED-AIR" OPERATION

Easier! Faster! Simpler! Uses only 2 levers to apply "Air-Ease" power to all turntable operations. A new concept in fingertip control. Retains full "feel" of clutches.

1¼-YD. SHOVEL

25-TON CRANE
(as fully convertible machine)

30-TON CRANE
(as heavy-duty lifting Crane on extra-wide crawlers)

The new 1¼-yd. Lorain-56 is the newest Lorain. There are many other models. Your Thew-Lorain Distributor offers the most complete selection of shovel-cranes on crawler or rubber-tire mountings. Shovel sizes through 2½ yards — crane capacities up to 61 tons.

THE THEW SHOVEL CO., LORAIN, OHIO

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- *Simplest operation in its class*

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Here is whiteprinting made easier than ever in the new low-cost Ozalid Streamliner 400. Compact, rugged, easy-to-operate . . . it delivers higher speed, greater volume, more "wanted" features than any other printmaker in its class.

Prints and develops at speeds up to 24 feet per minute . . . handles prints up to 42 inches wide. High-intensity mercury vapor lamp provides complete, uniform exposure. Patented evaporator and thermostatically controlled heater rod assure uniform print development.

Synchronized printing and developing sections permit continuous operation with roll stock. Short travel provides rapid processing of cut sheets. Automatic controls regulate temperature and ammonia flow. New electronic drive provides instantaneous speed changes with complete accuracy—simple enough for the novice operator!

Smartly styled, compact, the Streamliner 400 stands just 49" high, 63" wide, and 31" deep, and is finished in durable, ripple-gray baked enamel. One-piece enclosed base, welded-steel body and tubular support assure exceptional rigidity and permanent alignment.

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Call your local Ozalid representative. His expert advice is yours for the asking—whether or not you now own or plan to buy Ozalid equipment.

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Reader Comment

No Free Roads

SIR—Too many articles refer to Free Roads and Toll Roads. This is incorrect and not a true statement of the facts as they exist. This should read Tax-Supported Roads and Toll Roads. Too many motorists have been led into believing that they are getting highways free.

The motoring public should be made to realize that it pays for any road that is built. Taxes support federal, state and local highway systems while you pay a toll for the privilege of riding on a limited access toll road.

C. H. WALTER, JR.
South Bend, Ind.

Arch Dams for the U.S.

SIR—In reference to your editorial "Why Not More Arch Dams For The U. S.?" (ENR Apr. 12, p. 134) and the comment in the letter of Bruce M. Johnson (ENR May 17, p. 12), I wish to express a position about halfway between the extremes expressed. I agree with Mr. Johnson that it is not proper to make a "sweeping statement" that American engineers have avoided arch dams, per se. At the same time I definitely agree with your editorial that full advantage has not been taken of the arch dam possibilities in this country.

I believe that the most important point missed in both your editorial and Mr. Johnson's letter concerns "need of economy" as it affects the choice by an engineer of the "type" of dam to be utilized at a given project. Consulting engineering firms doing business for private investor-owned utilities must always strive for the greatest degree of economy possible; this need for economy has not always been recognized in recent years in this country when power projects have been in the design stage.

The consulting engineering firm with which I am connected has not only never "avoided" the adoption of

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

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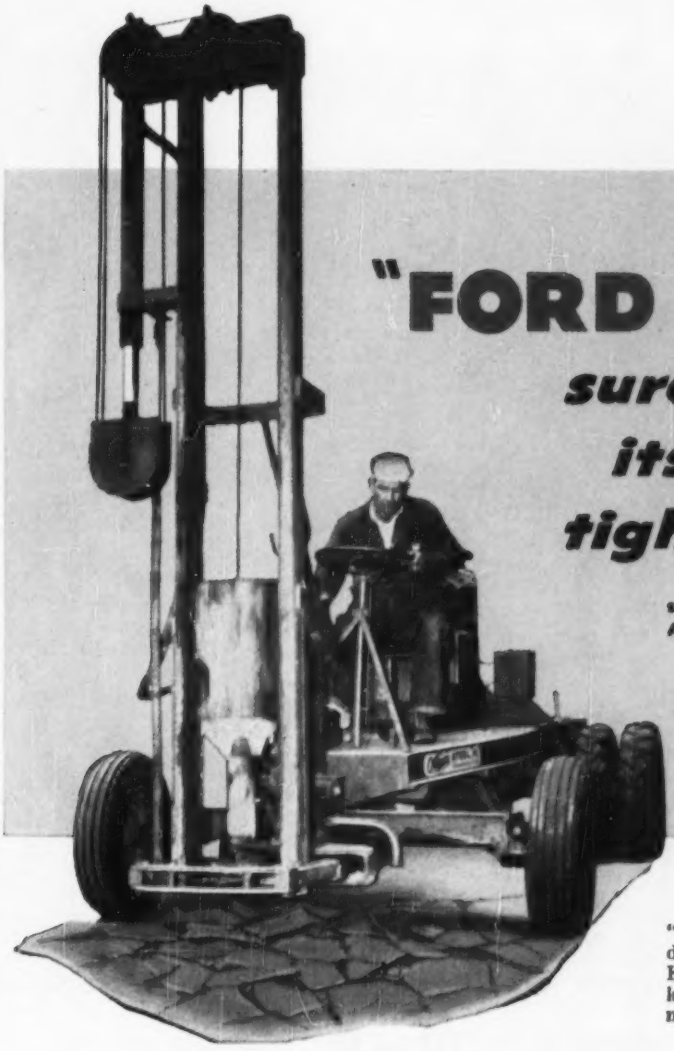


"FORD POWER sure proves its worth on tight schedules!"

says Mr. E. Chilquist, Const. Supt.
Alex Robertson Co., Walnut Creek, Calif.

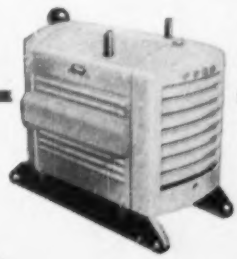
"We've relied on Ford Power to help us meet tough deadlines for twenty years now. First, because Ford Engines give us dependable performance under all kinds of operating conditions . . . second, when we need service we get it—*fast!*"

The Alex Robertson Co. is currently replacing underground steam and condensate lines at the Mare Island Naval Shipyard. And what a job it is! To reach the old lines, eighteen inches of concrete and asphalt must first be torn out. When the new lines have been laid, fill must hit 90 to 95% compaction.

Playing the vital role on this project is a Ford-powered Ottawa Hydra-Hammer. This one-man gang breaks up cement and rips through asphalt with unbelieving ease . . . cuts a four-foot swath *without* maneuvering the wheels . . . and creeps at an infinite number of speeds to meet changing working conditions.

Why is the Ottawa Hydra-Hammer Ford-powered? Let the Ottawa Steel Division of L. A. Young Spring & Wire Corporation tell you: "For some time past we have had an insistent demand for Hydra-Hammers equipped with water-cooled engines. After many tests it was determined that the Ford "134" Power Unit would give the best performance, cost less and be the easiest to service of all water-cooled power units."

Specify Ford Power for *your* next piece of equipment. You'll find that Ford can serve you better. Especially since a network of newly-appointed Ford Industrial Products Dealers has recently been set up across the nation. Now there's a Ford Industrial Power Headquarters right in your own area. Drop us a line for complete information.



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INDUSTRIAL ENGINES AND POWER UNITS

INDUSTRIAL ENGINE DEPARTMENT

FORD Division of FORD MOTOR COMPANY • P.O. BOX 598, DEARBORN, MICHIGAN

P&H HARNISCHFEGER CORPORATION, MILWAUKEE, WISCONSIN... uses Timken tapered roller bearings for practically friction-free operation in its heavy-duty cranes.

Champion weight lifter, never outlifted or outperformed —gets maximum capacity with TIMKEN® bearings

IN sheer lifting ability—size for size, around a full 360 degrees—this Harnischfeger Corporation 555A-TC has never been surpassed. Indeed, few truck cranes come close to this workhorse in versatility, safety features, maneuverability and on-the-job performance. 28 Timken® tapered roller bearings play a vital part in this outstanding record, in boom hoist drum, hoist and digging drum, swing shaft, front and rear axles.

The tapered design of Timken bearings, with full line contact between rollers and races, gives extra load-carrying capacity. And this same design lets Timken bearings take the tremendous radial and thrust loads in all combinations. To meet sudden shock loads, Timken bearings are case-carburized to get hard, wear-resistant surfaces over tough, shock-resistant cores.

Timken bearings are designed by geometrical law to have true rolling motion and manufactured to live up to their design. They practically eliminate friction, give long bearing life with less maintenance.

And with Timken bearings, housings and shafts are held concentric making closures more effective. Dirt and dust stay out, lubricant stays in. To insure unsurpassed quality control right down the line, we even make our own steel . . . something done by no other American bearing manufacturer.

Look for the "TIMKEN" trademark on every bearing, when you build or buy machines. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD

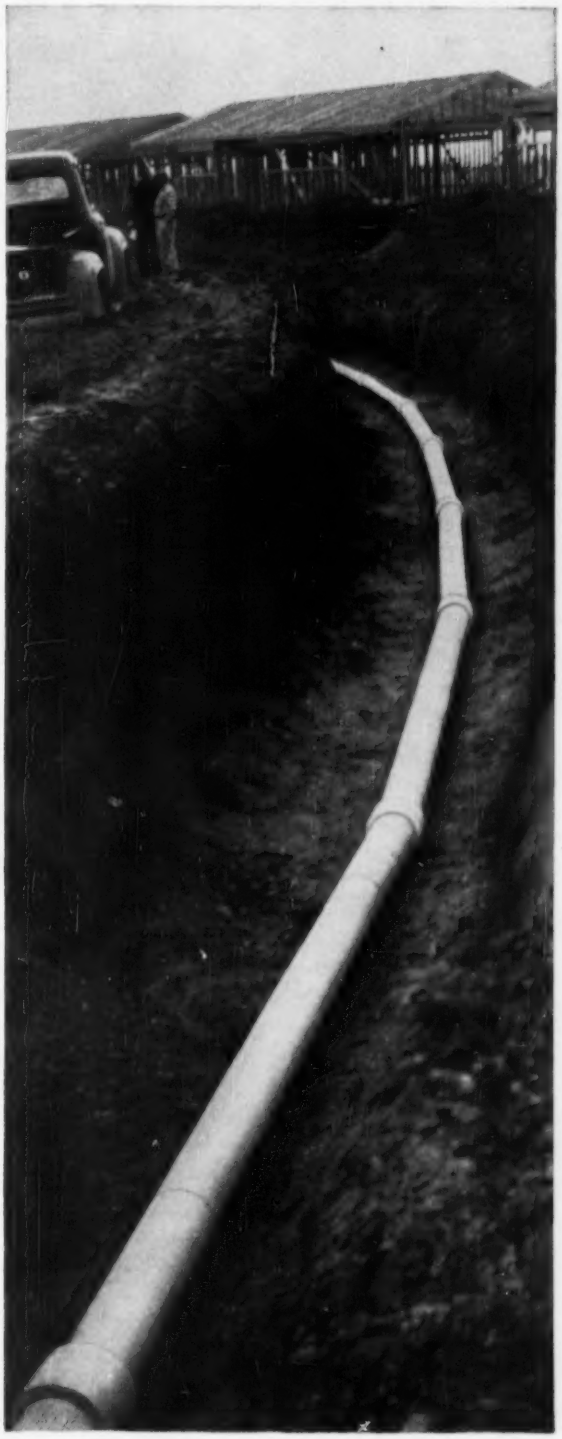
TRADE-MARK REG. U. S. PAT. OFF.

TAX SAVINGS "AROUND THE BEND"

with K&M "CENTURY"® ASBESTOS-CEMENT PRESSURE PIPE

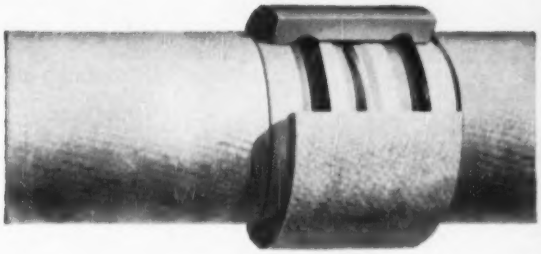
Cutting construction and maintenance costs means tax savings for Madison Park, N.J. And low cost is practically inherent in "Century" Asbestos-Cement Pressure Pipe and "Fluid-Tite" Couplings. The light weight makes for easy, inexpensive transportation and handling, while "Fluid-Tite" Couplings allow quick assembly even with unskilled labor, slashing laying time and cost. Its non-corrosive feature means long underground life. And "Century" Pipe is non-tuberculating and non-electrolytic . . . the bore is always clean and smooth. Pumping pressures remain continuously stable.

Find out how "Century" Pipe and "Fluid-Tite" Couplings can reduce construction and maintenance costs for you. Write today for full details.



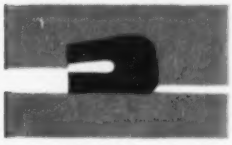
There's no problem in laying K&M "Century" Pipe in a curve. In this Madison Park housing development, "Century" Asbestos-Cement Pressure Pipe with "Fluid-Tite" Couplings allow 5° deflection but fit together easily, requiring no skilled labor for assembly.

and "FLUID-TITE"® COUPLINGS*

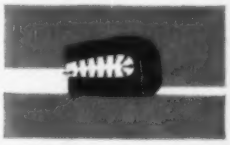


K&M's *exclusive* "Fluid-Tite" Coupling design allows pipe to slide into coupling easily. Water pressure automatically expands the rings.

*Patent applied for



"Fluid-Tite" sealing rings compress, permitting pipe to enter coupling easily.



Water pressure in main expands rings; the higher the pressure, the tighter the seal.

"Century" Pipe and "Fluid-Tite" Couplings meet A.W.W.A., A.S.T.M., and Federal specifications and are approved by Underwriters' Laboratories, Inc.

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. . . Reader Comment

an arch dam but has, in fact, been out in front in promoting arch dams in this country and abroad. The first paper presented at the ASCE Symposium on arch dams in Knoxville, June 5 described the results of our efforts to promote the first arch dam in the Far East. Here is a case where American engineers (not Europeans, who you feel have taken the lead from us) overcame almost unsurmountable obstacles in order to complete one of the highest true arch dams in the world in an area where ultra-conservative dam design has been the rule for many years.

We take exception to Mr. Johnson's statement concerning imagined difficulties which he believes arise when large floods must be handled at an arch dam. We have repeatedly discharged large floods over high arch dams and have never encountered any difficulties with scour below the dam. The second paper presented at the Symposium discussed the complete success of Portuguese engineers with center overflow arches.

There are proposed today—both in this country and abroad—by investor-owned utilities, true arch dams with center overflow spillways higher than any other arch dams, with or without center spillways, in this country. The Pleasant Valley dam of the Pacific Northwest Power Co. will be at least 534 ft high, and is designed for a discharge of 300,000 cfs over a center spillway.

The problem of "discontinuity of the arch action" in such cases was solved many years ago on the Waterville and Flathead dams; this solution has been applied to a great number of archs since.

The admittedly tedious, lengthy, and complex design computations required when utilizing the trial-load method of analysis have certainly deterred the development of arch dams in this country; however, like Mr. Johnson, I doubt if American engineers have avoided an arch dam for this reason alone. It is to be hoped that one of the more important results of the Symposium in Knoxville will be a better understanding of the limits and relative accuracy of the trial load method of analysis. Perhaps after this is accomplished, and, more important, if the desire for economy is extended throughout the engineering profession, there may be an upsurge in the utilization of arch dams in this country.

CHARLES C. BONIN,
Engineering Manager
Ebasco Services Incorporated
New York, N. Y.

Dofner Excavating Company,
Council Bluffs, Iowa.

"Trojan H-2 Multi-Purpose Grease Lasts 25% Longer Than Any Used Before!"

Around Council Bluffs, when there's earth to be moved, Dofner's the man. Excavating for roads, house, or building construction, he keeps his 21 dump trucks and other equipment in constant operation to fulfill his heavy job schedule.

But you'd never know this by the amount of gasolene or lubrication required. "The fact is," says Dofner, "I've found Cities Service Trojan H-2 Multi-Purpose Grease lasts 25% longer than any other grease I've ever used. And my dump trucks are actually running an average of 10 hours apiece and getting as high as 20 loads on one tankful of Cities Service Gasolene. Needless to say, I'm sold on Cities Service!"

Again and again, Cities Service receives reports such as this from construction men. If you'd like to know the reasons why, talk with a Cities Service Lubrication Engineer. Or write Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

MORE OF DOFNER'S EQUIPMENT AT WORK. Although he keeps it in almost constant operation, Dofner reports he's never lost a bearing and goes 25% longer between greasings since he switched to Trojan H-2 Multi-Purpose Grease.

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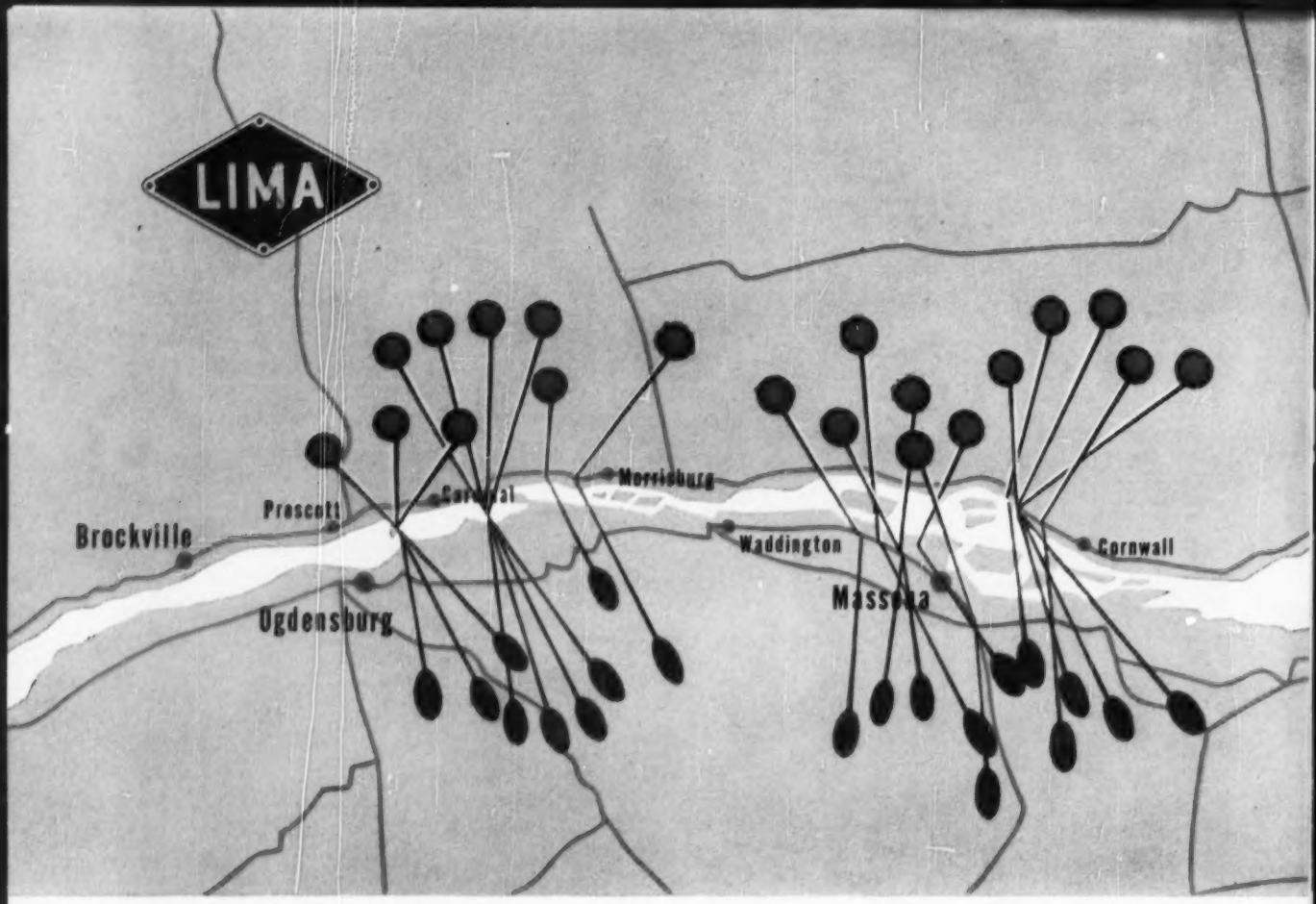


along the St. Lawrence Seaway . . . LIMA gives the BIG LIFT . . .

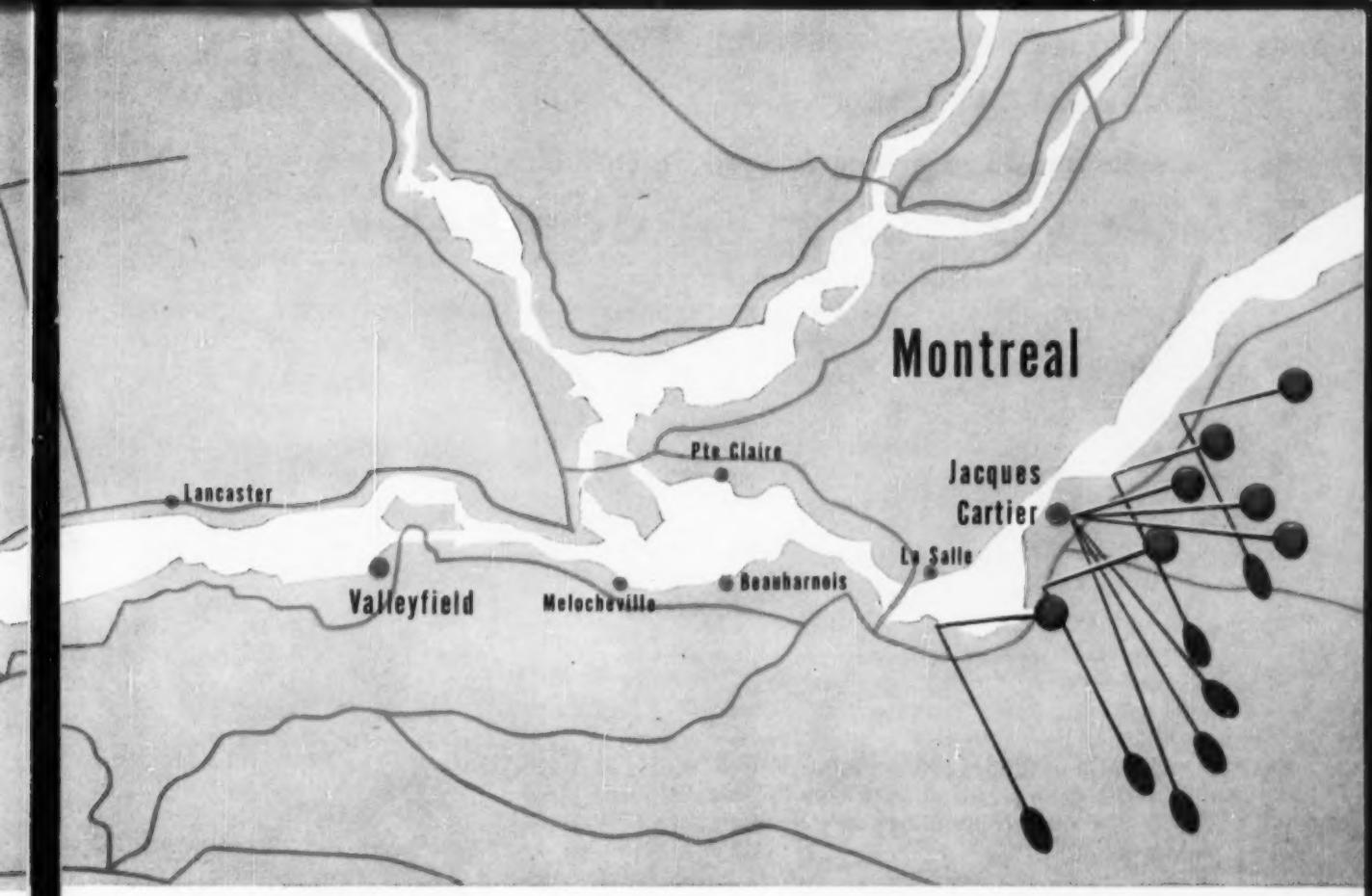
You'll find plenty of tough digging along the St. Lawrence Seaway. And all along the route—whether the digging's tough or easy—you'll find more than a score of Limas giving Seaway contractors the *big lift* that keeps their jobs moving steadily. Every contractor with Limas on the job is on time . . . or even ahead of schedule.

Due for completion in 1959, work is now well along on the 114-mile Seaway link between Ogdensburg, N. Y., and Montreal. The primary job is widening (to 450 ft.) and deepening (to 27 ft.) existing channels to permit passage of deep-draft ocean going vessels . . . all the way from the open sea to the heart of the continent. Also vital to the project is the building of locks, dams and power houses along the route.

From end to end of this mammoth undertaking, you find rugged Lima shovels and draglines hard at work moving millions of tons of rock, shale and earth . . . working on every type of footing. And wherever you see a Lima, you know that the work is on time. These quality-built machines move every type of material in fast, steady bites. More important, they've got the built-in strength and endurance to keep them on the job hour-after-hour, day-after-day, week-after-week.

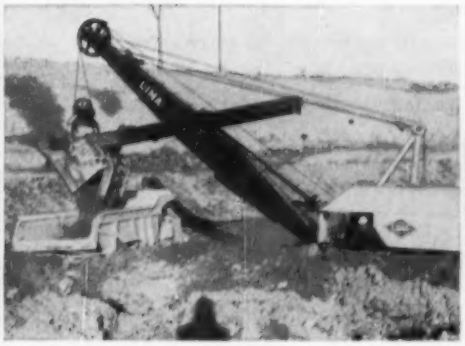
Seaway contractors are proving every day that Lima quality means high output, low downtime on even the toughest jobs. Let their experience be your guide! Get the full story today on the Lima cranes, shovels, draglines or pullshovels on crawlers or rubber mounts that can speed your digging and lifting jobs for greater profit. See your nearby Lima distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

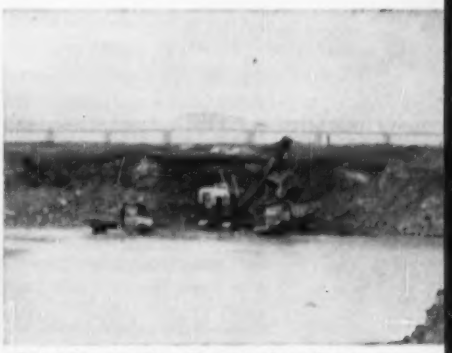


to keep contractors on time or ahead of schedule

This rugged 6-yd. LIMA Type 2400 is excavating on the Lachine Rapid Channel for *Miron & Freres, Montreal.* Their contracts call for moving over 4 million tons of earth. On this job—not due for completion until October, '56—work is now months ahead of schedule. That's how Lima quality pays off . . . with design and construction extras that let it handle the toughest jobs without costly breakdowns. A LIMA on the job keeps the job moving . . . fast!



In digging like this, LIMA extras—like pistoning-type dirt seals and retainers in crawler rollers—keep the machines *on the job.* This 4-yd. LIMA Type 1601, excavating for the Robinson Bay Lock, Massena, N. Y., is owned by *Tecon Corp. of Dallas, Texas.* Their LIMAs keep the work moving *on schedule.*



Walsh Construction, Toronto, depends on LIMAs like this Type 1601 to speed work on their dike and channel project at St. Lambert. They know that their fast-working LIMAs will keep the earth moving steadily in any weather, on any footing. The built-in strength and durability of these machines keep them working constantly . . . without costly, job-delaying downtime.

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directs choice of valves for new Rochester home of

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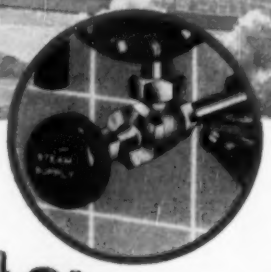
Architect: CARL L. TRAVER *General Contractor:* JOHN B. PIKE & SON, INC.
Heating Contractor: HOWE & BASSETT CO. *Plumbing Contractor:* BAREHAM CONTRACTING CO.



JENKINS VALVES qualify on long record of reliable performance as standard equipment on Castle Sterilizers since 1890.

The Wilmot Castle plant at Rochester, N. Y., completed in 1955, was planned with the same exacting standards applied to design of Castle's fine products — sterilizers and surgical lamps for hospitals, laboratories, and the medical and dental professions.

In selecting valves for the plant, the company could depend on their long experience with the faultless performance of the valves used on Castle Sterilizers, recognizing that all Jenkins Valves — bronze, iron, steel, and corrosion resistant — are made to the same high standards.

For *both plant and product,* the time-proved *extra value* of Jenkins Valves is dependable assurance of lasting efficiency, safety, and operating economy. Jenkins Bros., 100 Park Ave., New York 17.

THE LABORATORY AUTOCLAVE illustrated is one of the many types of Castle Sterilizers, and shows typical use of Jenkins Valves on the steam, water supply, and drain lines. Valves are renewable composition disc type, and have special heat-resistant, non-staining Bakelite handles, with each valve's function molded in the top. Jenkins Valves provide the sturdy construction, safety, and good appearance required. They also permit quick, easy maintenance, since the renewable discs, made also by Jenkins Bros., are available anywhere from Jenkins Distributors.

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

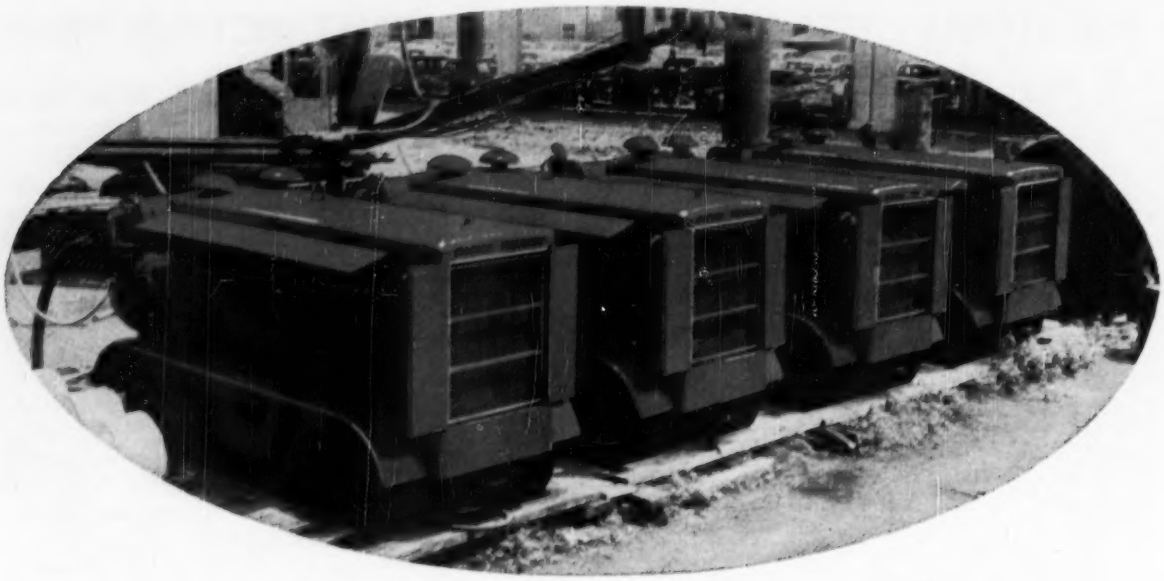
SPEEDIER CONCRETE TESTING—Look for an answer shortly to a problem that has been plaguing engineers on concrete construction: How to tell if the right quantity of cement has been put into a mix without having to wait at least a week to test cylinders made of the concrete. The American Society for Testing Materials is developing a standard test method for determining the cement content of freshly mixed concrete (see page 27).

ST. LAWRENCE BLUES—A third contractor has thrown in the sponge on a St. Lawrence Seaway job. Latest casualty is Dutcher Construction Corp. of Queenstown, Md., which bowed out on a $2.2-million excavation contract for Grasse River Lock in April with the job 91% complete. Dutcher then became a subcontractor for the five-firm combine known as Grasse River Constructors, which agreed to finish the excavation work without alteration of its $26.7-million contract for lock construction. Now Dutcher has quit even on the subcontracting work. Last October Jack and Jim Maser of Brownstown, Pa. defaulted on an excavation contract for Robinson Bay Lock (ENR Oct. 13, 1955, p. 23). Aiken Construction of Theresa, N. Y. also withdrew on a railway extension project.

OHIO'S TURNPIKE DILEMMA—Ohio's proposed Turnpike No. 2 (Cincinnati-Conneaut) was put on the shelf less than a month ago to await outcome of efforts to improve revenue on Turnpike No. 1 (see page 25) and for clarification of how new federal aid money might affect the project (ENR June 14, p. 28). Proposals to use federal aid funds for all or part of the proposed superhighway have been a subject of lively debate among road officials (ENR May 10, p. 19).

Latest move in the controversy is Gov. Frank J. Lausche's order directing the Ohio Highway Department to prepare plans for construction of two sections totalling 116 mi of the proposed 385-mi turnpike as a toll-free expressway. The governor's action was in response to the Ohio Highway Construction Council's refusal to approve $5 million for the department to prepare plans for the entire route.

LEST WE FORGET—While California's $11.3-billion state water plan was attracting all the attention, the U.S. Bureau of Reclamation quietly issued two small publications that serve as subtle reminders of the part the bureau has played and is playing in construction of water resource facilities in California. First was a USBR report to Congress titled "The Contribution of Irrigation and the Central Valley Project to the Economy of the Area and the Nation." And then USBR wrote: "California Water," a booklet depicting the state's water problem, suggesting the necessary movement of northern waters to the south, and leaving it all for the serious thought of the Californians.



CP "Power Vane" 600 cu. ft. Rotary Compressors

CP construction equipment is

"right on the job"

There's a CP Demo tool for every type of demolition work.

CP Super Triplex Tamper — the "one-man tamping gang."

Contractors specify Chicago Pneumatic when buying or renting construction equipment because they've learned that top performers like CP "Power Vane" Rotaries are always "right" on the job.

Chicago Pneumatic was first to give you a Rotary Compressor in a capacity to meet *every* job requirement from 900 to 125 cu. ft. And, CP Rotaries are proving themselves by logging thousands of hours of trouble-free service under every conceivable job condition . . . with an absolute minimum of attention.

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WASHINGTON OBSERVER

The $200 million added for Air Force base construction by the Senate Appropriations Committee won't be any increase at all—even if the amount is left in the Defense Department appropriation bill now going through Congress.

Reason is that a like amount will be deducted from the separate military construction appropriations bill that comes up for a vote later; that's the present plan, at least.

Air Force base building should start around $1.2 billion for the 12 months ahead, as scheduled.

•

Democrats keep winning battles for federal high dam at Hells Canyon—but the outlook is that they can't win the war.

Trades and political maneuvering may succeed in getting the House Interior Committee to approve the bill; the Senate committee has already voted for it.

Big fights will come on House and Senate floors if and when the bills get that far. Odds are against Congress clearing the bill for the President. If it got to the White House, it would almost certainly be vetoed. Idaho Power Co. has already spent $6 million, has committed another $9 million.

The Frying Pan-Arkansas project gets a new lease on life as a result of the Hells Canyon trading. The $156-million Cross Mountain diversion project should now go to both House and Senate for a vote.

•

Democrats are still working hard to make construction of power projects a big issue in the elections this fall. The word is out from the Democratic National Committee, advising Congressional leaders what they should do to help elect candidates who will need help in their campaigns.

An advisory committee on natural resources is preparing to make recommendations to the Democratic convention in August.

But more important is a run-down of helpful legislation the Democratic-controlled Congress could approve before it goes home. Such a list of politically important legislation has been in existence for a couple of months; it's in the form of a letter from Paul Butler, the National Committee chief, to Sen. Lyndon Johnson, majority leader of the Senate.

Niagara legislation would help Sen. Lehman, Butler says, noting the number of co-ops and municipalities interested in power in the area.

Approval of a federal high dam at Hells Canyon "is vital in the election of Democratic senators and representatives in the four Columbia Basin states (Oregon, Washington, Montana, and Idaho.)"

Permitting TVA to use power revenues for construction of additional power units—which Congress has already authorized—"will be of tremendous help this fall throughout the TVA area," Butler writes.

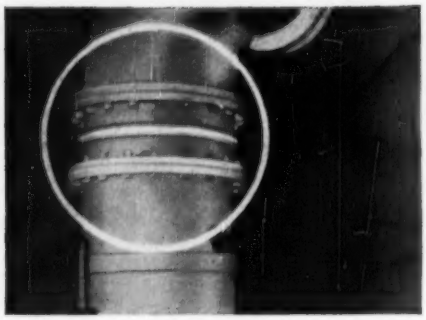
•

Higher construction forecast for calendar 1956 has come from Commerce and Labor Departments. The new figure is $44.5 billion, up $500 million from the original estimate made last November.

Bigger outlays for highway construction account for the difference. Actually, this represents a statistical correction stemming from government's discovery that it underestimated the pace of roadbuilding for 1955 and was projecting 1956 from too small a base.

Corrected 1955 highway building figure is $4.52 billion up $420 million from $4.1 billion. The new 1956 estimate is $5.15 billion, up $550 million from $4.6 billion of last fall. Revisions in other categories of public and private construction, some up and some down, balance each other out to within $50 million of the original estimates for this calendar year.

How long can a U. S. Rubber Expansion Joint last



...some have been on the job since 1926, the year they were invented!

Here are just a few reasons why *these flexible connections are used in pressure or vacuum pipe lines...*

- U. S. Rubber Expansion Joints are resilient and, therefore, do not, like metal, set permanently when compressed.
- Constant flexing merely keeps "U. S." joints "alive"...prevents them from becoming brittle.
- They absorb both axial *and* lateral deflection far more than metal joints. Greater insulation against vibration and pump noises is provided.
- There is never any electrolysis, corrosion or erosion.
- U. S. Rubber joints handle pressures from 40 lbs. to 125 lbs. Compare!
- The outside diameter of the arch is smaller than that on metal joints. Face-to-face dimensions (even with multiple arches) are smaller.
- Weight is much less. This, plus the fact that no gasket is needed between flanges (unlike metal joints) results in a more easy installation, lowering the cost.

"U. S." was the first to develop rubber expansion joints. They are at work in every kind of industry, prolonging the life of equipment in pressure or vacuum pipe systems. Obtainable at any of the 28 "U. S." District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y.

US RUBBER

Mechanical Goods Division

United States Rubber

How Homebuilders View Rest of '56

► Starts will go down . . . prices will go up

► Land getting scarce . . . zoning is tighter

► Money is a problem . . . lenders selective

A majority of homebuilders queried in an ENR survey of 27 metropolitan areas this week reported they will start fewer houses in the next six months than they did in the first half of the year.

Prediction of the continued slide in housing is based on a shortage of mortgage money in many areas and a growing scarcity of land suitable for mass housing.

Action by the Federal Reserve Board could ease the money market quickly, builders concede. This would result in a new surge of housing activity in the latter part of the year.

Upgrading of zoning requirements, which has become widespread, apparently is pushing land costs higher and discouraging some builders from mass housing operations.

The extent to which the money and land shortages will curtail housing in the next six months is an unknown. Builders in about half of the areas checked plan to carry out their original plans for the year, while the other half expects to cut back the number of starts from 10% to 50%.

The dollar volume of housing won't go down that much, however. In 21 of the metropolitan areas, builders plan to put up larger houses in the next six months, to meet a heavy demand for more bedrooms and a lesser demand for separate dining rooms, additional baths and finished basement areas. Many of these builders welcome the trend to larger houses. They feel it extends their market, and gives them better profit margins than the small, "economy" houses they have been building in the past few years.

Even in areas where there has been no substantial demand for larger houses, buyers apparently are looking for—and getting—other features, which run the cost up. Some of these features include built-in ovens, certain appliances, and even air-conditioning.

Homebuilders told ENR that it is necessary to include these items to keep sales volume at a high level because home buyers today are more selective. They insist on "getting more house for the money." Design is gaining importance in the buyers' eyes. And, they are "shopping around" more than they have in the past.

The selectivity of the buyers is matched by choosiness of the mortgage lenders in approving loans. Builders in 21 of the 27 areas said lenders are stricter now in determining whether a loan applicant is a good risk.

This has hit some builders hard, particularly in areas that relied heaviest on easy credit, with small down payments, long amortization periods —and the feeling that anyone who held a job could get a mortgage.

While some conditions are so prevalent that they fit into a national pattern, there is still a great deal of variety in the problems faced by homebuilders. Because housing essentially is "local," builders in some cities are more optimistic than ever about homebuilding prospects for the balance of the year—while others located in the same general area are tightening their belts.

This is what builders and lenders in the nation's metropolitan areas say is happening in their own areas:

► Boston

Boston's biggest builder of mass housing projects—Martin Cerel—intends to build more homes this year than last. But his optimism stands alone. Other builders anticipate a drop of 20% in housing starts this year in the Boston area.

Starts are down more than 20% to date, but the general belief is that the next six months will see a pickup from the year's slow start.

Boston builders foresaw the drop this year and made their plans last fall accordingly, expecting a decline of 20% to 25%. While they talk about the possibility of an upturn taking place during the second half, they haven't revised their plans yet.

Money is not the worry in Boston. Builders are having no trouble obtaining loans for mass housing. Land is another matter.

In fact, there has been a drastic drop in mass housing developments because land is no longer available—even high-priced land. One reason for this is the antagonism that small communities have against the influx of low-cost housing developments.

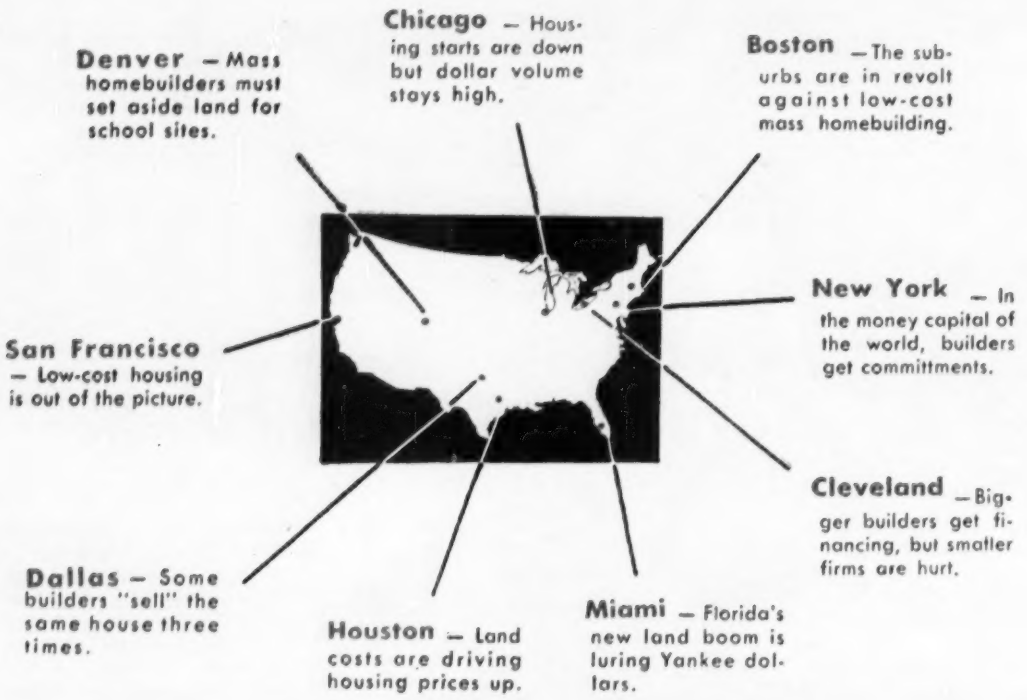
With a new $40-million plant, a manufacturer has been looking for a contractor to build 400 single-family homes and 200 rental units. But one of the major homebuilders in Boston told ENR, "I cannot find a town in the metropolitan area that will give me as many as 50 permits to build."

Land saturation has reached the point where the right of eminent domain is being used to take farmlands in the metropolitan area to provide housing tracts, needed for employees of new industries.

► New York

Long Island's Nassau County, which tripled its population in the past six years, is still the "hot spot" in the New York metropolitan region—and one of the most important areas in the nation for mass homebuilders. Builders there are more optimistic than their Boston colleagues, although the New Yorkers also have some problems.

Homebuilders in the New York area expect to start as many—or more —houses in the next six months as they did in the first half of the year. Benefiting from their nearness to the money capital (lenders seem to listen sympathetically to builders' requests for money because of their own first-hand knowledge of the communities),


Chicago — Housing starts are down but dollar volume stays high.
Denver — Mass homebuilders must set aside land for school sites.
Boston — The suburbs are in revolt against low-cost mass homebuilding.
New York — In the money capital of the world, builders get committments.
San Francisco — Low-cost housing is out of the picture.
Cleveland — Bigger builders get financing, but smaller firms are hurt.
Dallas — Some builders "sell" the same house three times.
Houston — Land costs are driving housing prices up.
Miami — Florida's new land boom is luring Yankee dollars.

builders haven't been affected noticeably by the tight money market.

As in Boston—and other areas—New York homebuilders complain about the difficulty of getting large tracts of land for mass housing projects. But their plight is not as serious as in other areas, although some communities (notably Westchester County cities and some in Suffolk County) are fighting the influx of low-cost mass housing by substantially upping the zoning requirements. (Some require a minimum of an acre of land for each house; others bar mass housing because of ordinances prohibiting clusters of homes that "look alike".

These devices raise home prices, builders say. But home prices also are due to rise in the New York area because of a trend to larger houses and because of higher construction costs.

▶ Buffalo

Homebuilding in the Greater Buffalo area already has started to rise sharply, promising to make up for the weather-dampened spring slowdown.

Large-scale builders report no difficulty arranging mortgage commitments with banks in the area, but they do find that buyer prospects who look like eligible buyers to them are being turned down with greater frequency by lenders.

This is widespread. Banks report that so far this year 50% of the applicants for mortgages have been rejected. This figure includes rejections for both new and used homes. But even on new homes alone, 15% to 20% of those applying for mortgage loans are turned down. This means that many builders "sell" the same house several times before they get a sale that will stick.

▶ Philadelphia

Homebuilding presents a good, solid picture in the Greater Philadelphia area, eastern Pennsylvania, south Jersey and Delaware despite unseasonable weather in the first half of the year that dragged the level of housing starts below 1955.

With few exceptions, homebuilding will trail 1955 this year. But that's due to the first six months. An upturn is expected during the latter part of the year.

Experienced builders aren't having any serious financing trouble. But, improved land is a big worry. Prices of land have doubled and even tripled in the past five years and are still swinging upward.

Tougher minimum land rules play a part in this. Some areas require an acre—or more—of land for a house now. And, the requirements for site improvements are going up.

Builders generally are constructing —or planning—larger homes. But the price won't go up in direct ratio to the size. The demand for four bedrooms, for example, often is met by featuring an expansion attic which can be finished later as a fourth bedroom. Separate dining rooms are coming into their own and finished basement areas are considered almost a "must," builders say.

New home prices will go up. The cost of a $12,000 home will jump some $350 to $400 and more expensive homes will rise proportionately. Pennsylvania's 3% sales tax (based on 40% of the builder's cost) will account for part of the increase. Higher labor costs and rising land prices add the rest.

▶ Baltimore

Starts are expected to be down during the second half of the year because of seasonal and market factors.

Land within the Baltimore city limits is almost non-existent for mass housing. Builders are forced to go further and further out of the city, and are running into heavy utility costs in improving this raw land. So far, larger builders have been able to cope with the situation but smaller firms have been put into a squeeze.

Baltimore County also is hiking its zoning requirements. Builders feel that some of the zoning changes are good; others are bad. And, in some parts of the county, builders feel the planners are deliberately freezing out mass housing projects through excessively high zoning.

Tight money also is having its effects. Small builders are having trouble getting construction loans, although bigger builders do not. Banks

have been selective in the past in granting mortgage loans and apparently have not stiffened their standards. The buyers, in turn, are selective in what they will purchase.

One builder, commenting on this, said, "Up to a year ago, you could sell anything. Now architectural finesse is required. Houses must be well-planned and well-equipped because the buying public is better educated."

▶ Atlanta—Columbia—Nashville

Three areas in the South, Atlanta, Ga., Columbia, S. C. and Nashville, Tenn., seem to share many of the same problems—and to have the same outlook on housing for the next six months.

In these areas, tight money is holding housing activity down. But, the theme seems to be that it's the buyers, not the builders, who have trouble getting money.

For example, VA-guaranteed home loans are a big factor in Atlanta homebuilding, and some builders admit they're sitting tight until Congress decides whether or not it will extend the GI home loan program. If Congress lets the VA program expire next July, the effects will be felt this year. If the program is continued, builders will feel the future prospects are good and they will step up their operations.

This is not only true of Atlanta, where GI loans account for about 40% of the market, but also Nashville where the percentage of VA loans runs even higher (Some estimate as much as 60% of the total market).

▶ Durham—Miami

In contrast to the somewhat-worried outlook in Atlanta, Columbia and Nashville, two other cities in the South are rated "bullish"—Durham, N. C., and Miami, Fla.

The homebuilding outlook in North Carolina is exceptionally bright with the feeling that the second half will be the strongest six-month period since 1947, topping the first six months of this year by as much as 10%.

Miami homebuilders shrug off a 12% drop in the first half of the year, say they'll more than make that up in the next six months.

Builders in these cities are enthusiastic about prospects even though they have seen some tightening of mortgage credit and are going through a period of rising costs. Prices in Durham, for example, may be up as much as 5% in the next six months because of higher land and construction costs and because the state's 3% sales tax has been extended to building materials.

Miami's experience is similar with costs pushed up by higher land and materials prices. Some Miami builders, however, have sharply cut back on their building plans simply because of the high price of land.

Competition also appears keen in Miami because local builders are witnessing an influx of newcomers in their ranks. One veteran Dade County (Miami) builder said that 90% of the developers in the area are merchant builders with no previous experience in construction. "They are pouring in with Yankee dollars because they have read of the new Florida land boom," he said. "They hire a superintendent, enough land for 150 to 200 houses and put ads in the paper."

▶ Jacksonville—New Orleans

Two other southern cities—Jacksonville, Fla., and New Orleans—are more conservative about the prospects for the balance of the year.

Jacksonville homebuilding so far is down 25% to 30% from last year and not much, if any, improvement is expected in the second half. New Orleans builders plan to start as many units in the next six months as they did in the first half of the year—but they're not optimistic about the chances of carrying out those plans because of the uncertainty of financing—which also lies behind Jacksonville's poor showing.

The New Orleans project builders say they have trouble getting commitments. Jacksonville builders, on the other hand, report they can get the money—but they don't want to pay the high discount rates on FHA and VA mortgages. FHA's are discounted 2½ to 3 points; VA's 4 to 4½ points.

Prices will move up some in Jacksonville but New Orleans expects to hold the line, with builders willing to shave their profits in the face of higher land and construction costs.

▶ Dallas—Houston—Oklahoma City

Three of the nation's fastest-growing metropolitan regions, Dallas, Houston and Oklahoma City, are slowing down. Because of tight money, builders in these areas agree they will start fewer houses in the next six months. In two of the metropolitan areas—Houston and Dallas—plans have been pared since last fall.

All three find it more difficult to get mortgage commitments. And, they agree that banks are more selective, leading, in turn, to "repeat sales" of the same house.

Ample land is available for builders in the three areas, although improved land is not as easy to find now as it has been in the past.

The trend is toward more expensive, larger houses—with more profit for the builder. In Oklahoma, the value of the average house has gone up $3,000 in the past year—because of the switch to larger homes. This has resulted in a completely new look for the housing market in that state. Last year, 30% of the homes sold for less than $10,000 and another 25% were in the $10,000 to $12,000 bracket. Now, few builders operate in the under $12,000 class. It means that about 50% of the market has been upgraded into a substantially higher price bracket.

▶ Denver—Seattle—Portland

In the Pacific Northwest, builders hope to regain some of the ground lost in the first half of the year, when Denver, for example, fell 30% behind the comparable 1955 period.

Mortgage money is costly and hard to get in Denver, Seattle and Portland. Discounts are a serious factor in mortgage costs because of the prevalence of VA-guaranteed home loans.

Lenders in these areas are more selective and for a time rejections ran comparatively high on mortgage applications. This has turned up less frequently in recent months, mostly because builders themselves screen potential buyers more carefully. And Denver banks achieve their selectivity by upping the down payment requirements.

Undeveloped land is readily available in the Denver, Portland and Seattle areas. But substantial tracts near good arterial highways, public transportation and schools are getting scarce. And, in any deal for large tracts of land in these areas builders worry about two things: water supply and price.

Denver has an unusual distinction. It is one of the few major areas in the nation where a mass homebuilder must set aside a certain percentage of land area for school sites.

Passing up separate dining rooms in favor of "country kitchens," Denver, Portland and Seattle homebuyers demand more bedrooms and finished basements. Higher home prices in the next six months will reflect the increase in size of the homes as well as higher land and construction costs.

▶ San Francisco—Los Angeles

Both San Francisco and Los Angeles expect fewer housing starts in the second half of the year, even though volume in the first six months was well below year-ago levels.

The scarcity of mortgage money is blamed for the sharp downturn in housing. In San Francisco, for example, where government-insured loans ac-

. . . Outlook for homebuilding

count for two-thirds of the mortgages, FHA applications in the first four months of this year were down 40% and VA's were down 27%.

Local mortgage money in Los Angeles is "about as tight as it has been in the past 14 years," according to a spokesman for the larger homebuilders. One savings and loan official in Los Angeles said his bank is not encouraging any builder to develop large tracts because funds are tied up in commitments issued previously.

Land availability—and land prices—have not figured significantly in the Los Angeles housing picture yet. But in San Francisco, most of the good sites for large projects have been taken and builders are forced to use hilly land where development costs are high. Builders are compelled to spend more for streets, sewers, street lights, water and other improvements. Local areas sometimes add expensive requirements of their own.

School sites also offer a problem. In most areas, the school district decides if a school is warranted. If so, the district buys the land from the builder—at the raw land price—and "it's usually the best site in the tract," builders complain.

Prices probably will go up in both areas in the next six months, although competition for customers is so keen among builders, particularly in San Francisco, that the increase will be small. San Francisco homebuilders, in fact sometimes offer to accept the buyer's old house as a "trade-in," and some even guarantee a buyer that he will be able to sell his house if he ever chooses.

▶ Indianapolis—Cincinnati

The second half shapes up almost as a repeat of the first six months in Indianapolis and Cincinnati. Activity is slower than last year and builders have cut back last fall's plans by about 15% in Cincinnati and by 5% to 10% in Indianapolis.

Both cities rely heavily on conventional loans, and mortgage money is available—at a price. FHA and VA mortgages sell at discounts of three to four points. Some builders balk because of this, and it is a major factor in the slowdown.

Larger houses will bring second-half price boosts in both cities. Cincinnati probably will see more substantial increases because land and construction costs have been rising faster there.

▶ Cleveland—Chicago—Detroit

Builders in the Cleveland metropolitan area expect to start more homes in the second half of the year than in the first six months when a local strike and bad construction weather teamed up to account for an 18% drop in starts.

Chicago's homebuilders say starts will be down but dollar volume will about equal the first half of the year.

Detroit expects a further drop in housing starts in the next six months. The three offer different outlooks—and they differ also on the degree to which tight money has affected them. Cleveland, for example, reports that smaller builders without prior commitments are hurt but big builders are not. Banks, however, have tightened up on buyers and rejections run high particularly on buyers for the less-marketable small homes.

Chicago banks also are more selective about mortgage loans—but money isn't tight there, even for the largest projects.

And, in contrast, Detroit says it has been hit hard. Local FHA personnel say that mortgage money for large projects had literally dried up—that the shortage is the most severe on record. VA's and FHA's are discounted heavily—and the mass builder is most affected. One official commented, "A builder erecting one house gets a warm welcome; one building 50 houses gets a cold shoulder."

Cleveland builders are getting their land in the suburbs (where zoning is being upped), Detroit project builders are running out of tracts, and Chicago builders are being forced into building higher-priced houses because of the spiraling cost of good building sites.

▶ St. Louis—Des Moines—Little Rock

Housing starts will be down in the second half in St. Louis and Des Moines—and will be touch-and-go in Little Rock, depending on financing.

St. Louis and Des Moines have trimmed their earlier plans from 5% to 15%. But Little Rock homebuilders claim they are within 60 days of their three-year construction goals.

Some St. Louis builders are having trouble getting mortgage commitments; others are not. Bigger builders in Little Rock get the money they need, while smaller firms are often turned down. And, in Des Moines, the tight money crimp is felt by big and small builders alike.

Large tracts of land—at a reasonable price—are scarce in St. Louis and Little Rock, where prices are moving up as the builders bid for land outside the city limits.

It's the builders themselves who are, in effect, upping the zoning requirements in St. Louis. But in Des Moines and Little Rock, municipal action is the source of tightened zoning rules.

Dewatering of Kemano Tunnel Is Planned

Aluminum Company of Canada officials confirmed last week that it will be necessary to dewater the big 10-mi Kemano Tunnel in its British Columbia project to investigate the cause of lowered water pressure (ENR June 21, p. 17). The tunnel supplies water to the turbines powering the company's smelters at Kitimat.

Officials in Vancouver were tight-lipped regarding specific measurements of the decrease in the flow of water. Company engineers were still checking. But the official announcement said that the loss in head indicated "the probability of an obstruction near the center of the tunnel" that may have resulted from the closing off of an access tunnel.

"The possibility of a rock fall, such as could cause a partial blockage is greater at this point than elsewhere," the company said. "It will be necessary to dewater the tunnel to obtain complete explanation of the interference of the flow."

Removal of the obstruction, although not expected to be of a major nature, must be undertaken as soon as possible since a serious rock fall in the 25-ft-high, horseshoe-shaped passageway would certainly halt production at the smelter.

Company spokesman said the power presently obtainable in spite of the observed loss of head in the tunnel which brings water from Tahtsa Lake to the underground powerhouse at Kemano, is "in excess of that required to supply the company's existing smelters at Kitimat, as well as the additional smelter unit now under construction.

However, an expansion at Kitimat, planned in the next few years, will require the full design capacity of the tunnel.

Three more generators are yet to be installed at the Kemano power development. These will be installed in stages during the next four years and Kemano powerhouse will have 900,000 kw installed by 1960, representing half the power project potential.

Tunnel and rock workers in Vancouver who worked on the tunnel when it was built felt it would probably be easy enough to remove the obstruction, but only after the tunnel was completely dewatered.

Road Bill Ready

Senate-House group agree, bill now ready for action

With Congressional conferees in final agreement on controversial points in the long-debated federal highway bill, final adoption of the $37.6-billion measure was seen as a formality early this week.

Here are the main points worked out last week by the House and Senate conferees:

- The interstate mileage is extended from 40,000 miles to 41,000 miles; but, cost of building any extra mileage a state gets cannot be included in its estimates of cost to complete the interstate system.
- Apportionment of the $25 billion of federal aid money for the interstate roads will continue on the present method used—based on population, area etc—for the first three years; then, it shifts over to a needs basis with states getting money based on the percentage of uncompleted interstate mileage. States will have two years to use apportioned money, amounts that lapse will go to other states. Where states want to, they can build roads beyond their actual apportionment with eventual reimbursement to be made at a later date. Matching will be on a 90% federal-10% state basis on the interstate system; 50-50 on other roads.
- The Davis-Bacon Act applies to interstate construction, but the Secretary of Labor is to consult with states before setting minimum wages.
- Money will be raised to pay for the 13-year building program through a 16-year stepped up tax system estimated to bring in $14.8 billion from a one-cent increase on gasoline, diesel and special fuels, three cents a pound increase on tires, a new three-cent tax on retread rubber, a two per cent excise tax increase on manufacturer's price of new trucks, busses, and trailers, and a new annual tax of $1.50 a thousand pounds on highway trucks weighing 13 tons and over. Tax increases on fuels and rubber do not apply to vehicles that do not normally use the road system.
- Hold downs are placed on expenditures for the highway program; the Administration won its point to limit annual expenditures of federal money to the amount brought in by user taxes.
- Size and weight limits are placed on big trucks using the interstate road system; limits are set at: 18,000 lb on single axles, 32,000 lb on tandem axles, gross weights at 73,280 lb, and widths of 96 inches. States can use these standards or those in effect as of July 1, 1956—whichever is greater. But states cannot hike interstate limits over these standards if they are to get federal-aid money for roadbuilding.
- Initial tollroad or free way reimbursement is not provided for. Studies will be conducted to determine if such payments should be made with Congress ultimately making the final decision. The Secretary of Commerce will submit a report on the matter to Congress by January 1958.
- Where states pay for relocating utilities, they will be reimbursed by the federal government in the same proportion as federal money is being used on the project where utilities are relocated—on a 90-10 basis for interstate roads, and on a 50-50 basis for other roads.

In detail, funds authorized in the new measure for the federal-aid primary, secondary and urban roads for the next three years are:

For 1957—$700 million authorized under existing legislation, plus $125 million additional under the new bill, for a total of $825 million; a total of $850 million for 1958, and a total of $875 million for 1959. After 1959, new appropriations will be made.

At random, here is what some of the states will receive in those three years:

New York, $451.3 million; Texas, $381.8 million; California, $367.5 million; Pennsylvania, $341.3 million; Illinois, $304.2 million; Alabama, $107 million; Georgia, $152.1 million; New Mexico, $80.8 million; Nevada, $67 million. Vermont, with $37 million, is at the bottom of the list.

POLLUTION BILL: Federal Aid Provision In

Federal grants to cities for sewage works construction remained a part of the final version of the water pollution control bill as approved by House-Senate conferees on Monday of this week.

Just as opposition in the House fell short (118 to 112) in an attempt to knock grants to construction from H.R. 9540 as it was passed, Senate conferees failed to remove the aid provision from the needed bill. Final passage and signing into law is expected this week; the existing 1948 act expires Saturday.

Conferees did two things to change the House bill as it pertained to the aid question: They wrote in a provision requiring each state to draw up a priority list of cities needing aid, to be presented to the Surgeon General. They cut the authorized aid to 30% of cost or $250,000 per project (from ⅓ or $300,000).

Truck Toll Cut

Ohio Turnpike officials act to placate truckers

The Ohio Turnpike Commission has reduced its toll rates for trucks and buses and authorized a 10% discount to companies paying more than $2,000 worth of tolls per month.

The revised toll rate structure—which does not change passenger fees—will be in effect only from June 26 through September 30, 1956. The commission then will evaluate reaction of the trucking industry, and if traffic increases sufficiently the schedule will be extended.

J. E. Greiner Co., Baltimore, consulting engineers on the turnpike, has told the commission that the new rates for buses and trucks should produce additional revenue "substantially more than $1.5 million per year." Greiner based its recommendations on a toll rate study by the traffic engineering firm of Coverdale & Colpitts, New York.

Under the revised structure, tolls will be decreased by from 3% to 28.2% on all but the lightest weight classifications. The biggest reduction is in Class 7—the 53,001-65,000-lb gross weight range—where the present $17.75 through trip rate is being lowered to $12.75. Tolls on the lighter weight vehicles (7,001 to 16,000-lb gross weight) will be boosted 25 cents on a one-way trip, from $4.75 to $5. However, the commission points out that this class still will pay a lower rate than at present if tolls make them eligible for the 10% discount.

Spokesmen for the trucking industry termed the new toll rates "very fair" and predict that commercial fleets will start swarming over the 241-mi, $326-million superhighway. "We can equalize, and in some cases beat, the axle-mile tax levied upon vehicles using the public roads," says one trucking leader.

Although turnpike toll rates are higher than the axle levy, other factors such as time, load and reduced mileage may make the turnpike more economical from an operational standpoint.

In recent months much concern has been voiced about truckers by-passing the superhighway to travel freeways because of what they termed excessive toll rates. Now, however, Turnpike Chairman James W. Shocknessy says: "If the revision in the truck rate schedule produces commercial traffic comparable to passenger car traffic already using the Ohio Turnpike, our worry will begin to be about adequacy to accommodate the traffic volume rather than solvency."

Water, Water

Detroit has headaches with too much, too little

The water supply situation in and around Detroit was plunged into a state of confusion last week as the Detroit Board of Water Commissioners announced an $85-million scheme to tap Lake Huron for enough water to supply both the city's future needs and those of the surrounding area.

Previously, the board's attitude was for adjacent communities to develop their own supplies. Wayne County (less the City of Detroit) recently announced plans for a $40-million project, including an intake in the Detroit River below Detroit with pumping and 150-mgd treatment facilities. And two other counties near Detroit, Oakland and Macomb, are in the process of setting up their own water authority to tap Lake Huron.

Observers feel that one large tap of northern waters is the cheapest method of bringing relatively pure water to the Detroit area. The desire to go 60 odd miles upstream stems from increasingly frequent taste problems—caused by phenols—at Detroit's present intake on the Detroit River opposite the city. This problem and quality of water worsens further downstream on the Detroit River, such as at the proposed intake for Wayne County.

Relatively pure water is found in Lake Huron, 60 mi north of Detroit, and also along the St. Clair River connecting Huron with Lake St. Clair near Detroit. The Detroit River begins at Lake St. Clair and runs southerly into Lake Erie.

Thus, Detroit's latest maneuver will probably bring plans in the surrounding area to a halt until the scheme is carefully evaluated. Detroit intends letting contracts for the first phase of its big plan in about 12 to 18 months. This will involve $32 million to expand the city's Northeast pump and filter station.

Actual development of the northern water source will require the remaining $53 million and is anticipated for 1966 completion. It will consist of a new water intake, most probably in Lake Huron but possibly on the St. Clair River nearer Detroit; a new filter plant near the intake point; several water reservoirs; and the big item, an 84-in. pipeline to the Northeast pumping station.

The project is to be financed by revenue bonds, most of which, it is thought, can be amortized by sale of water to Detroit suburbs. Detroit Mayor Cobo says that city water "would stay at the same low rates" and that county water users would still be getting a bargain.

The City of Detroit, with some 3,000,000 people, now consumes an average 455 mgd. It has 875 mgd of filter capacity (194 1/40-acre beds rated at 4.5 mgd each) and has under way a 180-mgd expansion at Springwells station. The upstream development would provide an additional 240 mgd of filter capacity, for a total of 1,290 mgd.

• **Storm water problems, too**—Hard on the heels of the potable water confusion in the Detroit area came a 3.5-in. rainfall (on June 17) which, because of inadequate storm sewers, did "millions of dollars worth of damage" according to insurance company preliminary estimates.

Spurred by a vocal citizenry, the Detroit city government met in emergency session last week and authorized immediate expenditure of $8 million for relief storm sewers in the northwest part of the city. The "emergency" work will actually be a slight speedup of Detroit's master sewer plan of 1950 which contemplated the spending of $100 million over a 15-year period. Pace of the plan—now a $150-million program because of rising construction costs—will probably be accelerated to a 1962 completion date.

Suburbs of Detroit, which were already talking about accelerated storm drain construction before the latest rain (ENR June 21, p. 28) have also authorized emergency sewer construction. Biggest damage in these areas was suffered by ranch homes on floating slabs—many literally did just that.

Koolau Mountains Project Finally Tunneled Through

Workers finally have tunneled through Wilson Tunnel in Honolulu's Koolau Mountains—two-and-one-half years after they started what had been planned as a seven-month job.

Most of the final 900 ft of the 2,775-ft traffic tunnel is only an exploratory drift shaft to determine soil conditions left by three 1954 cave-ins. But one 40-ft segment encases a jumbo rig, cut off but not crushed in the final collapse that killed five men. The rig, worth about $30,000, may be salvaged.

Two other events involving the tunnel took place earlier this month (ENR June 7, p. 36). A $1.4-million contract was awarded for construction of a 3.2-mi section of approach highway to serve the tunnel when it is completed late in 1957. And more than $1 million in damage suits were filed in Honolulu courts against the city-county for the five deaths caused by the cave-in.

Professionalism

NSPE develops a guide to employment practices

The National Society of Professional Engineers has developed a recommended set of criteria which may be used as a guide for professional employment of engineers.

Now being printed in booklet form, the criteria are essentially a restatement of "professional status" in terms of employment, and cover such topics as recruitment; indoctrination; technical, administrative and personality development of individuals; company practices; salaries; engineering titles; personnel practices; and termination policies.

They were devolped by the Engineer-In-Industry Subcommittee of NSPE's Employment Practices Committee and will soon be mailed to NSPE affiliates, engineering executives in industry and deans of engineering schools. The booklets will also be available to college seniors to aid them during their recruitment interviews.

In its introduction to the booklet, the subcommittee says it hopes the criteria, as a guide to both employers and employed engineers, will establish some of the "rules of the road" for recognizing and treating engineers as professionals. "The professional status of the employed engineer, in all its manifold aspects," the subcommittee states, "needs to be fully recognized by the employed engineer and his employer if full and complete professional growth of the engineering profession is to be developed."

The cornerstone of the criteria is a set of four "basic principles," adopted by the subcommittee as a guide to its entire program:

1. The only satisfactory method of dealing with engineer-employer relationships is on a cooperative common-interest basis.

2. The engineer shares an equal responsibility with the employer in elevating his professional status.

3. Management should regard the engineer as one indentified with the "management team."

4. The engineer must be "company minded," thinking in terms of the company's problems and growth, as well as his own.

Divided into two parts that express first the company's viewpoint and then the engineer's, the criteria are arranged by major categories of engineering career development. Each category contains the applicable principles and a list of questions that can be used to evaluate current company and engineer practices.

At annual meeting, ASTM members hear . . .

New Design Theories Proposed

With a record-breaking attendance at its 59th annual meeting last week held in Atlantic City, N. J., the American Society for Testing Materials developed many new specifications, improved old ones and advanced into new fields. Much of this work and several of the 32 technical sessions affect the construction industry.

Rudolph A. Schatzel, vice president and director of engineering, Rome Cable Corp., Rome, N. Y., was elected president. Prof. Kenneth B. Woods, head of the School of Engineering and director, Joint Highway Research Project, Purdue University, became vice president.

Attendance at the meeting reached 2,850. This tops the previous record of 2,606, registered in 1952 at the society's 50th anniversary meeting. More than 800 committees met during the week.

• **New design theory**—A new approach in bituminous pavement design is being developed by the flexible pavement laboratory, soils division, of the Corps of Engineers Waterways Experiment Station, Vicksburg, Miss. This was disclosed by J. L. McRae, chief of the bituminous and chemical section. An attempt is being made to develop a laboratory compaction procedure that will simulate prototype compaction—not only as to compactive effort but also as to compactive action. If successful, this will allow direct selection of the optimum condition independent of specific gravity and voids considerations.

Prof. Clyde E. Kesler and Tien S. Chang, University of Illinois, reported tests that indicate that it may be possible to predict the long-time behavior of concrete from tests taking only a few minutes. Using sonic apparatus, they found that there is a relationship between the static and dynamic behavior of concrete. Their results show that magnitude of creep in concrete depends not only on time but also on the ratio of sustained stress to ultimate strength, ratio of dynamic modulus to ultimate strength and the logarithmic decrement. For cylinders loaded to less than 50% of the ultimate strength, creep is approximately proportional to the percentage of sustained stress.

• **Scope expands**—Moving into new fields, ASTM organized a group on putty and glazing and calking compounds. It will be a subcommittee of D-1 on Paint, Varnish, Lacquer, and related Products.

A possible expansion of the scope of Committee C-3 on Chemical Resistant Mortars will be studied by a task group. This new field will include membranes and sheet materials now used in conjunction with brick work and chemical resistant mortars.

The group of research subcommittees of Committee C-9 on Concrete and Concrete Aggregates reported developments in many phases of concrete and aggregate study. Such problems as the effect of long-time creep on concrete and a cooperative program on the pore structure characteristics and requirements of aggregates are in this category. In the test methods and specifications group, a proposed method for measuring the thermal coefficient of expansion of concrete has been prepared for publication as information. A draft is being prepared of a method of determining cement content of freshly mixed concrete.

A proposed specification for natural pozzolans has been approved in subcommittee and revisions in the existing specifications for fly ash were proposed which would raise the SO_3 content to 5%.

• **Revise mortar "spec"**—Two changes in tentative specification for mortar for unit masonry (C 270 T) add a water retention test in the proportion section of the specification and recognition of the use of portland blast furnace slag cement. A complete revision of the tentative specification for mortar for reinforced brick masonry (C 161 T) is planned by the committee.

Committee C-15—The requirements of new brick as covered in the specification for building brick (C 62) were recommended for change in respect to the waiver of the absorption and saturation coefficient requirements.

The use of a weather index based on a map proposed by the U. S. Weather Bureau was proposed as a criteria for this requirement in place of the present 20-in. rainfall measure.

Sulfur capping was recognized as being a satisfactory material in preparing brick for testing in standard method C 67, this being proposed as a tentative revision.

• **Steel under study**—Committee A-1 on Steel appointed task groups to draw up specifications for the following types of concrete reinforcement: Rods in coil form; steel for prestressed concrete; and larger diameter bars than are presently covered in ASTM designation A 305.

Specifications for high-strength structural steel for use in riveted or bolted bridges will very probably be published by the society later this fall.

Also, some people have not been satisfied with the rivet steel covered by specification A 195; a new spec. for alloy steel rivets is being developed to cover these objections.

When the Rains Came, This Island Went

Six boats pull and three push a three-acre chunk of land to a new location along the shore of Kettle Moraine Lake in central Wisconsin. The seven-ft thick "island" had been floating around the lake for a short period of time after it had broken off from the shoreline during a recent spring storm.

CAT* DW21 – NO. 470

LOWBOWL

SCRAPER

OUTLOADS COMPETITION IN ON-THE-JOB TESTS ON KANSAS TURNPIKE

1. TESTS WERE MADE on contractors' jobs on the Kansas Turnpike. They covered a period of three weeks. For each comparison, the competing units were loaded under similar conditions. Soil density tests were performed right in the loading area to provide an accurate measure of scraper load in pay yards.

2. FIELD ENGINEERS weighed load after load as the competing units passed over a portable platform scale. By subtracting average empty weight from average gross weight, they determined average net load weight. In every test, the No. 470 Scraper with exclusive Caterpillar Lowbowl design consistently carried larger payloads.

3. JOB STUDIES showed that the new turbocharged 300 HP DW21 Tractor had the "go" to equal or beat other units in cycle time while carrying more pay yards. Other features contributing to this unit's success were large 29.5-29 tires, an efficient power train, synchro-safe brakes and the fast, responsive No. 27 Cable Control.

4. LOWBOWL DESIGN, developed by Caterpillar, is a feature of the No. 470 Scraper. With this new concept, the bowl has been widened and lengthened, yet its depth has been decreased. But Lowbowl design is more than just dimensional changes. As the tests show, material is loaded with less resistance clear out to the end of the loading cycle.

TEST RESULTS

No. 470 Lowbowl Scraper (18 cu. yd. struck capacity) vs Competition

No. 470 AVERAGE LOAD	Scraper A (18 cu. yd. struck capacity) AVERAGE LOAD
18.1 BANK CU. YD.	**14.8** BANK CU. YD.

LOWBOWL ADVANTAGE: 3.3 bank cu. yd. per load

Test conditions: Damp silty clay—density: 3300 pounds/cu. yd. **Weight Comparisons:** Average net load, pounds: No. 470—59,840; Scraper A—48,675.

Comments: On one load, the operator of Scraper A was asked to obtain maximum heap. It took 2.40 minutes of push loading to pick up a load which weighed 58,875 net pounds—less than the average load carried by the No. 470!

No. 470 AVERAGE LOAD	Scraper B Sideboarded—18 cu. yd. struck capacity AVERAGE LOAD
18.1 BANK CU. YD.	**14.3** BANK CU. YD.

LOWBOWL ADVANTAGE: 3.8 bank cu. yd. per load

Test conditions: Sandy clay. Density: 3100 pounds/cu. yd. **Weight comparisons:** Average net load, pounds: No. 470—56,225; Scraper B—44,400.

Comments: Average loading time for both machines was comparable. In total cycle time, the DW21 had the advantage. Its transmission provided a better match to rimpull requirements, and its shorter turns saved time on the fill.

No. 470 AVERAGE LOAD	Scraper C (18 cu. yd. struck capacity) AVERAGE LOAD
18.1 BANK CU. YD.	**14.3** BANK CU. YD.

LOWBOWL ADVANTAGE: 3.8 bank cu. yd. per load

Test conditions: Damp silty clay. Density: 3300 pounds/cu. yd. **Weight comparisons:** Average net load, pounds: No. 470—59,840; Scraper C—47,290.

Comments: Scraper C, like Scraper A and the No. 470, has a rated capacity of 18 cu. yd. struck. On the job, where results, not rated capacities, are the true yardstick of a machine's ability, the No. 470 Scraper with Lowbowl design decisively outloaded the other two.

No. 470 AVERAGE LOAD	Scraper D Sideboarded—18 cu. yd. struck capacity AVERAGE LOAD
15.6 BANK CU. YD.	**13.3** BANK CU. YD.

LOWBOWL ADVANTAGE: 2.3 bank cu. yd. per load

Test conditions: Heavy clay. Swell about 40%. Density: 3440 pounds/cu. yd. **Weight comparisons:** Average net load, pounds: No. 470—53,550; Scraper D—45,630.

Comments: In the tests, Scraper D scored next best to the No. 470. *Scraper D is the "old" DW21-No. 21*, a unit that set records for high production at low cost the world over. Now, in the new DW21-No. 470, Caterpillar has produced a unit that's even better—and way ahead of competition!

Results on the job, not rated capacities, are the only true measure of a machine's ability to produce. Check the results here and judge for yourself how much the *extra yards* moved by the DW21-No. 470 Lowbowl Scraper can mean *profit-wise* to you!

Your Caterpillar Dealer has a complete report of this on-the-job test on the Kansas Turnpike—as well as similar reports from other sections of the country. Ask him to show you the advantages of Lowbowl Scrapers on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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BIGGER, FASTER LOADS WITH LOWBOWL SCRAPERS

"Why do we have to wreck the bridge? Why not jack up the approach ramp to fit the new construction?"

OVERPASS APPROACH RAMP is being jacked up to fit new freeway interchange construction—see bent at left. Part of the

So They Did . . .

Overpass Deck Jacked 13 Ft to Make New

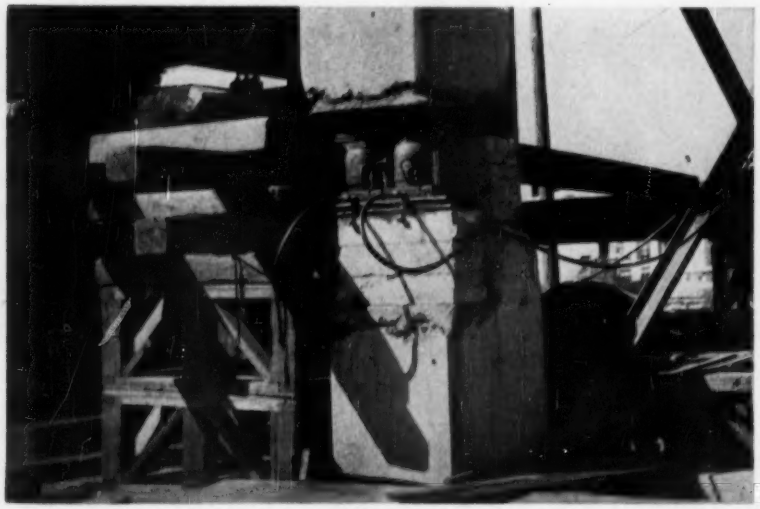
Jacking, instead of wrecking, saved the tidy sum of $65,000 on a Berkeley, Calif., interchange project.

Involved is an overpass structure built in 1937 that takes University Ave. over the Southern Pacific main line tracks. A current construction program calls for the overpass to tie in with an interchange structure on the Eastshore Freeway a few hundred feet west of the railroad tracks. California Highway Department bridge engineers decided that, rather than demolish the overpass approach ramp, 330 ft of its length be jacked as much as 13 ft to meet the freeway interchange level.

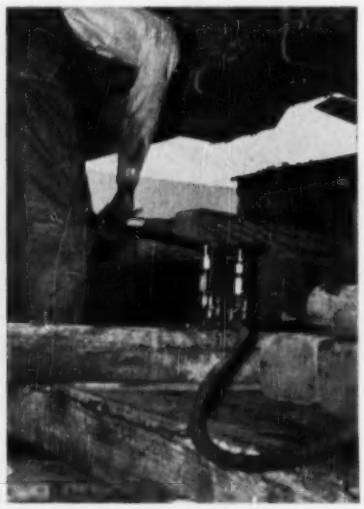
The work is being done by R. B. Montgomery, Oakland housemover, who holds a subcontract under Stolte, Inc., and Gallager & Burk, Inc., prime contractors on the $2-million freeway project.

The jacking procedure is relatively simple. But it is slow and tedious. Montgomery already has been on the job four months and it looks like it will take another couple of months to finish.

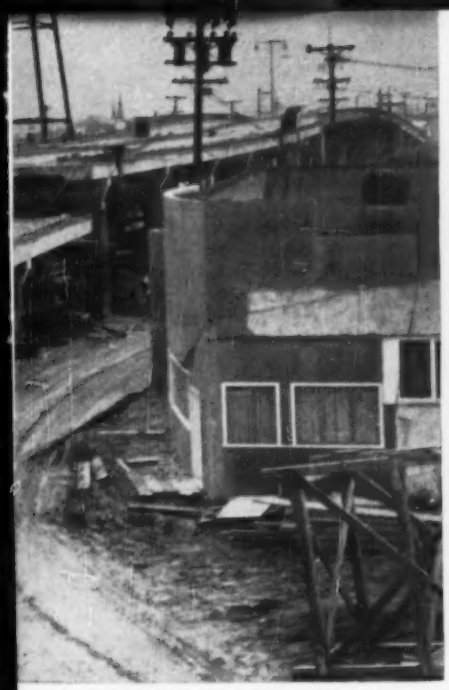
The work was started by cutting a temporary joint through the continuous flat slab concrete deck. Then columns in the seven bents to be jacked were cut. A short section about 100 ft long was moved laterally a few inches to separate it from the rest of



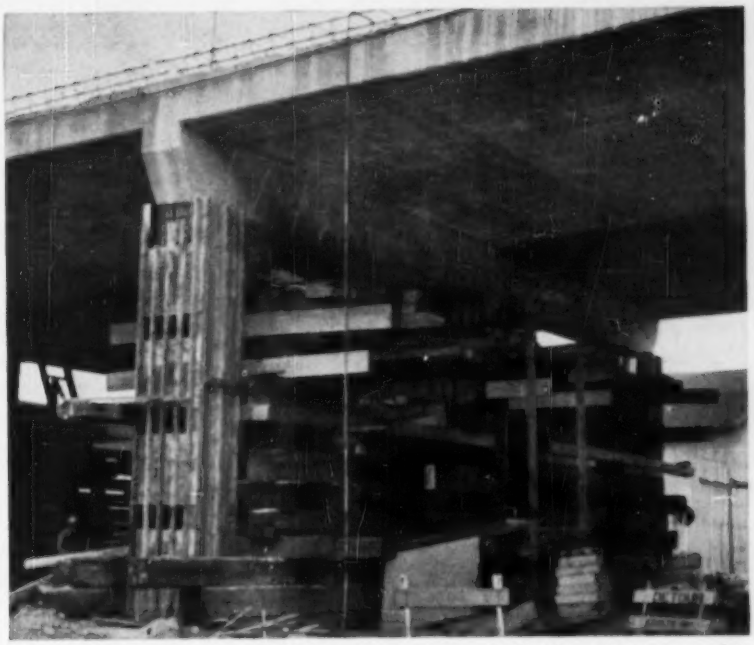
JACKS IN COLUMNS handle some of the lift. To reduce strain on jacks because of increasing eccentricity of columns, contractor devised base plate assembly to include roller nest.



HYDRAULIC PUMP feeds manifold that distributes pressure uniformly to each of the eight jacks in a bent. All bents in



bridge deck is in new position while another section is yet to be fully moved.



JACKS ON TIMBER CRIBBING handle high lifts. Eight 50-ton jacks are used in each bent. Cribbing is raised for each lift.

Bridge From Old

the deck at an expansion joint. The remaining portion was jacked as a unit even though another expansion joint occurred about in the middle of it. To keep the deck from separating at this remaining expansion joint, twelve 1¼-in. cables on the deck of the bridge tied the two sections.

To start with, jacks were inserted in the columns. But, where the vertical movement became great, eccentricity of the columns was such that jacking in the columns had to be abandoned. Instead the jacks were mounted on timber shoring.

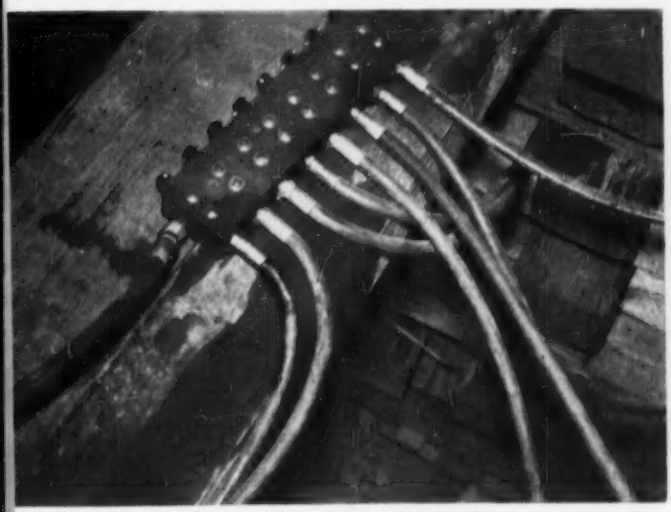
Eight 50-ton jacks were used per bent. All eight jacks in each bent were operated from a central manifold that was fed pressure by a hydraulic pump. Maximum thrust of the jacks was 5½ in. When the jacks in any one bent reachel maximum thrust, it was necessary to retract them in pairs and shore the intervening space.

Some difficulty was encountered with the eccentricity even in a 5½-in. lift. This resulted in an unequal strain on the jacks causing them to bind. Remedy was a base plate detail that included rollers to accommodate the lateral movement.

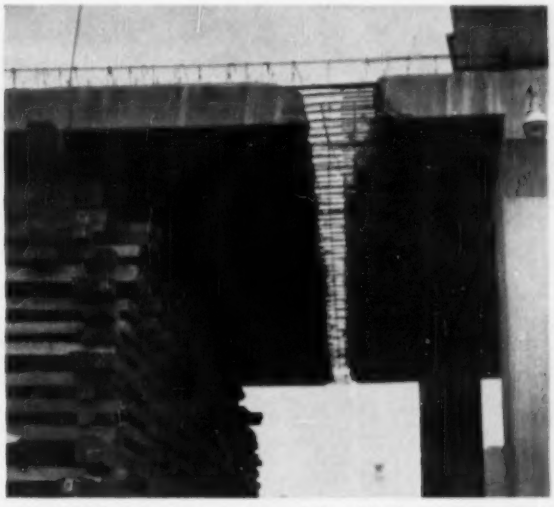
Surveyors checked alignment on the bridge deck to make sure that the 1-in. maximum tolerance at any one bent was maintained.

Cost of the jacking operation is estimated at $65,000. Bridge Department engineers figured it would cost $130,000 to replace the ramp.

Resident engineer on the freeway project for the Division of Highways is L. A. Anderson. Guy D. Mancarti is Bridge Department representative; his primary assistant is David Gee.

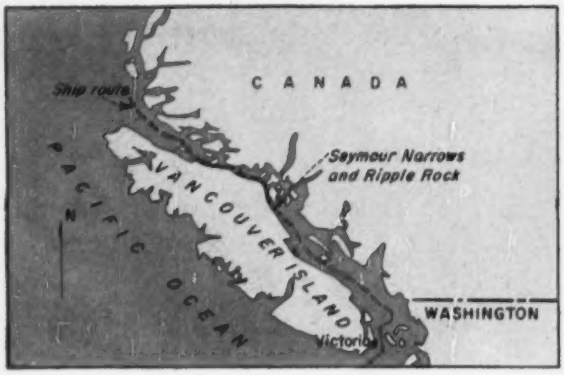


each section were packed simultaneously with surveyors checking to limit deviation at any one bent to 1 in.



ARTIFICIAL JOINT was formed by chipping away concrete. As far as possible, steel was not disturbed except that tension in bottom layer required that it be cut.

Navigation of Inside Passage to Alaska is endangered by two prongs of rock near water surface. Some 25,000 cu yd will be sheared off in one . . .



Big Blast at Ripple Rock

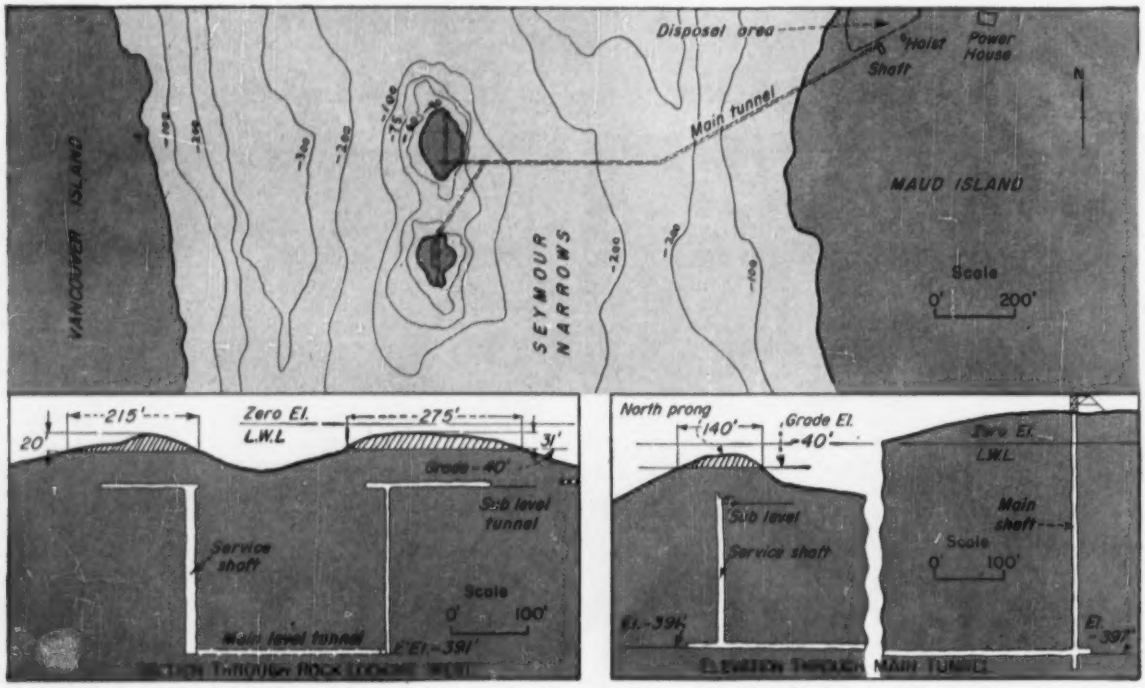
With one huge explosion 18 months hence, the Canadian Department of Public Works hopes to shear off about 25,000 cu yd of rock now hindering navigation in the Inside Passage to Alaska. Contractors are driving 3,800 ft of tunnel and shaft from a small island to gain access to two prongs of Ripple Rock, at present 9 and 20 ft below low water level in the middle of Seymour Narrows, 100 miles north of Vancouver. They are to be blasted to an elevation of −40 (LWL at El. 0).

The tortuous tunnel access scheme was devised only after previous drilling attempts from barges anchored in the Narrows failed and various other means, such as shooting the pinnacles off with torpedoes or bombing them with blockbusters, were considered.

At an estimated cost of $2.5 million, the present attempt is pretty expensive excavation—$100 per cu yd—but well worth it to Canadian and U. S. shippers. In the last 75 years, Ripple Rock has been responsible for 115 lives and loss or serious damage to 14 large ships and 100 smaller vessels. Current in the Narrows averages 10 knots during 250 days of the year, and the rock causes much turbulence. Navigation is usually limited to two daily slack tide periods of 20 to 40 minutes duration causing ships to line up for hours waiting to go through.

Seymour Narrows is two miles long and an average 2,500 ft wide. Near the south end, Ripple Rock rises in the shape of a hogsback. To get to it so explosives can be placed, a 500-ft vertical shaft, 18x7 ft, is being drilled in the green basalt of tiny Maud Island. From the shaft bottom a 7-ft-dia tunnel 2,370 ft long will be driven to points under Ripple Rock. At least 100 ft of rock will be above the tunnel all the way.

Two access shafts, each about 300 ft high and 15x7 ft in section, will lead up from the tunnel. Crosscuts, measuring 6x6 ft and totaling 370 ft in length, will be driven from the raises along the axes of the pinnacles. Finally, a honeycomb of 6x6-ft en-



TORTUOUS TUNNEL ACCESS scheme was resorted to only after failure of previous attempts to drill from barges.

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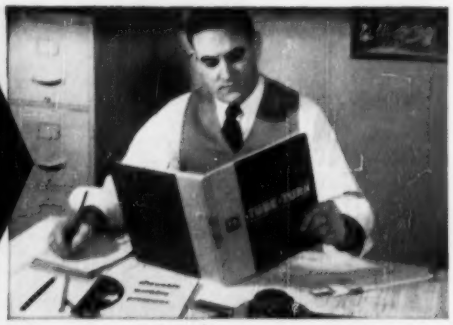

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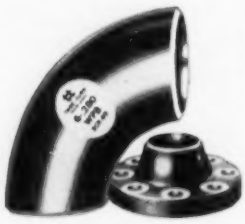

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tries and 3x5-ft drifts will be driven for the big chamber blast to follow.

Conventional mine drilling gear and blasting methods are being employed on the main vertical shaft on Maud Island. Diamond core drilling has indicated that only normal mining problems will be encountered. Rotary drilling will also precede each phase of heading driving to check for water seepage and determine need and extent of grouting.

A single blast will be relied upon to sheer off both prongs of Ripple Rock. No plan except simultaneous destruction of the two sections has been considered since hazards of tunneling afresh after blowing one pinnacle first are too unpredictable.

As yet undetermined is the firing pattern, although 750 tons of an explosive containing 92% ammonium nitrate (but no nitroglycerine) will be used.

Extensive preparation in the surrounding area will precede the blast—expected to be heard 50 miles away. Everyone within 25 miles of Ripple Rock will be warned to leave windows open. Water traffic will be held back 15 miles distant. Even the fish will be considered in timing the blast. The big blow is expected early in 1958.

Victor Dolmage, Vancover consulting geologist, planned the project for the Federal Department of Public Works. Northern Construction Co. and J. W. Stewart Ltd. (a single firm and subsidiary of Morrison-Knudsen) and Boyles Bros. Drilling Co. Ltd. are the contractors.

Arizona Scientists Try New Rainmaking Research

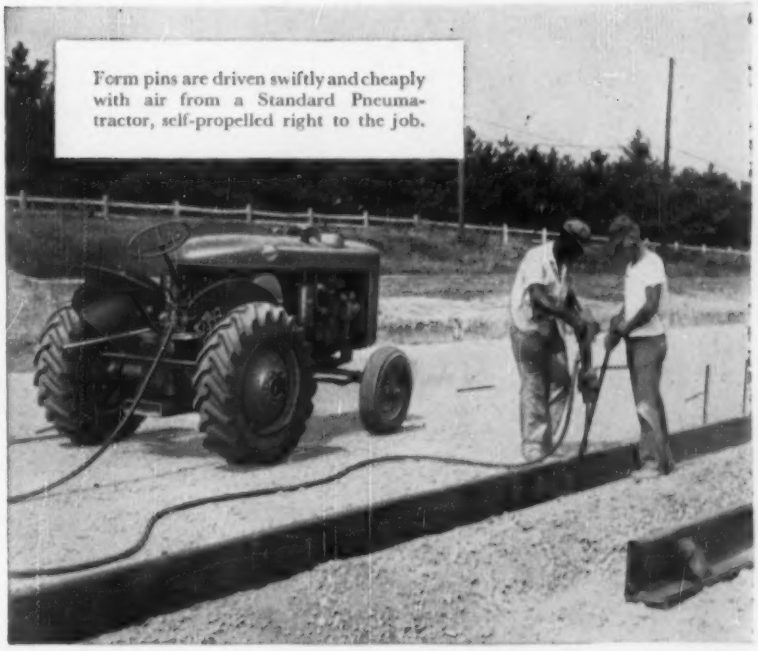
Rainmaking snoopers at the University of Arizona are going on aerial chases to see just what happens to particles released into the atmosphere by silver iodide ground generators.

Eventually the project may have some bearing on rainmaking.

The scientists plan to pursue tiny fluorescent particles through the air. The particles are supposed to soar into the clouds and trigger raindrops.

But effectiveness of this technique never has been positively determined. There's some doubt whether they even reach the rain-laden clouds.

The Arizona group plans to bounce particles of zinc sulphide pigment—which fluoresces under ultra-violet light—into the air from ground generators and follow their flight. Project purpose is to trace what happens to the fluorescent particles—this paralleling what happens to the silver iodide, particularly if the particles get to cloud height in the vicinity of mountains.



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From Newark Airport Interchange . . .

Newark Bay-Hudson County Extension Is a Top-Flight Construction Problem

With the recent opening of a 3.6-mi section of New Jersey Turnpike's Newark Bay-Hudson County Extension, traffic began to roll over what is claimed to be the most costly section of highway ever constructed.

The full 8.2-mi, $118-million extension, connecting the turnpike's Newark Airport Interchange with the Holland Tunnel (link between New Jersey and lower New York City), is a six-lane, limited-access toll expressway for its entire length. The section now open includes a $20-million high-level bridge over Newark Bay, which measures 9,560 ft from abutment to end pier. Lanes are 12 ft wide, with three-lane roadways separated by a 6-ft median strip, except on the major bridge where the median was reduced to a steel-or-concrete barricaded four feet.

Though only 32% of the entire route is on embankment, more than 6,000,000 cu yd of fill material was placed. The remaining 68%—including the bridge—is elevated on reinforced concrete frames that contain more than 240,000 cu yd of concrete.

While the cost of the big bridge structure is reflected in the $14.5-million-per-mi cost of the overall project, it is only one cost-booster encountered in design and construction.

Elevation of the toll link, with construction of viaduct and miscellaneous structures, accounts for more than $34 million of the high cost. Reasons for elevating most of the route are: The tollroad penetrates one of the busiest rail yard areas in the country, requiring ten separate crossings; and the northern (Holland Tunnel) end of the extension passes through a densely populated industrial and commercial area with its accompanying surface activity which couldn't be interrupted by earth embankments. Only short embankment fills were possibly near Newark Bay, since most of the route is over water.

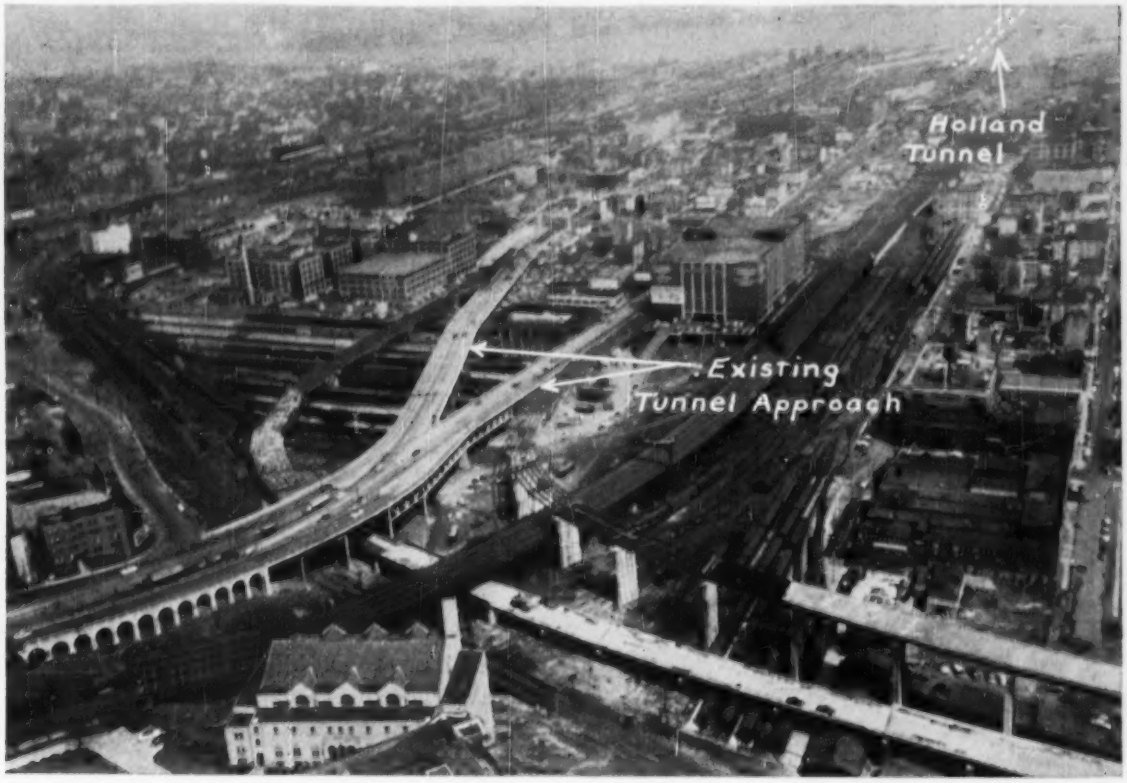
Foundation conditions were highly variable. Footings were founded on rock, soil, timber piles, steel H-piles, steel H-piles inside large-diameter pipes and encased in concrete, closed-end steel pipe piles filled with cast-in-place concrete and drilled-in caissons.

Pile lengths varied considerably. Selection of the type of pile at any location was affected by economy, material penetrated, possible corrosion and proximity of adjacent structures. One five-block stretch took 35,000 lin ft of cast-in-place piles.

• **Obstacles**—Route location survey crews ran into serious problems before they had set their first station marker, and the situation didn't change until most of the concrete and all of the steel was in place. Acquisition costs were high over the entire northern leg of the route, extending from the Caven Poinnt-Bayonne Interchange to the Holland Tunnel approaches.

Location problems included these:

• First, it was found that one of the five railroad lines had to be relocated under part of the northern leg. It had to be moved off to the east of the



. . . to Holland Tunnel Chinese Puzzle

highway. And the railroad relocation necessitated face lifting and platform relocation on a freight building.

• Fifteen buildings belonging to the U. S. Army had to be demolished and then replaced. An adjacent lumber reclamation area had to be moved.

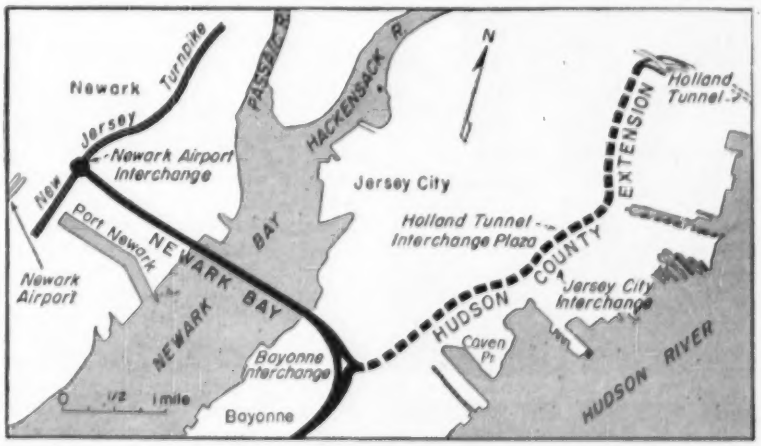
• Several sanitary and drainage outfalls had to be reconstructed, with necessary concrete cradle construction on piles. A 4,000-ft pipeline had to be installed for an oil storage concern. Mill Creek outfall, an open sewer and the main outfall from the city of Jersey City, had to be relocated since it crossed the viaduct at two places. Mill Creek is one of those sanitary lines that is being tied in under the extensive Jersey City sewage treatment program and, in relocation, its integration into the closed sewerage system was a prime consideration.

• A street was relocated near the Bayonne-Jersey City line to make room for the Bayonne interchange.

• At the point where the Holland Tunnel end of the extension swings down to grade level, it comes within six inches of a terminal building, whose freight platforms had to be relocated on the opposite side of the structure. In this area also, it was necessary to build a temporary parking lot for a radio and television manufacturer.

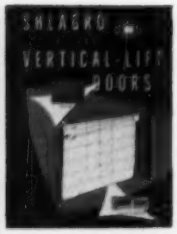
• **Rats cause delay**—On two occasions operations were slightly delayed temporarily by communities of rats. At one location there was a large pile of Navy rafts that had been stored for several years since World War II. The first action in transferring the pile to a location off the right-of-way resulted in an exodus of so many of the ro-

(Continued on page 38)



Direct Route between New Jersey Turnpike and lower New York City will be accomplished with opening, this summer, of northern leg of extension (dotted line).

Ask For Catalog No. 100



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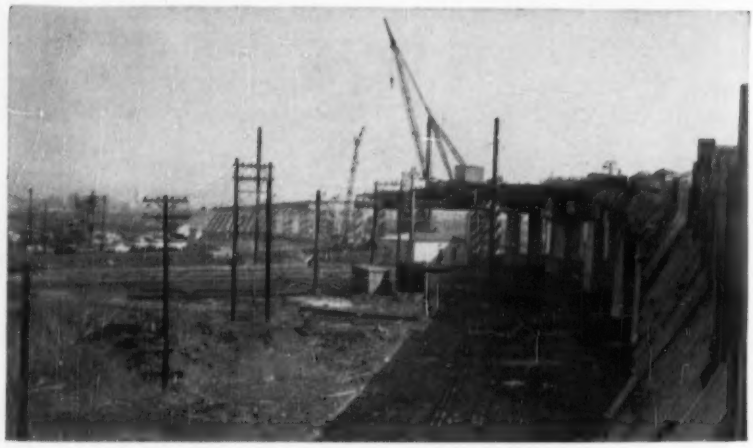
. . . Newark Bay—Hudson County Extension

Major Structure is a $20-million, 9,560-ft bridge across Newark Bay.



Southeast Viaduct is 2,600 ft long, hurdling three railroads and causing relocation of another. All bent foundations rest on piles, some 120 ft long.

dents that the operations had to be suspended during extermination.

A second such incident resulted in a job holdup when an old spaghetti factory had to be cleared of tremendous communities of rats before demolition could be started. Engineers on the project are convinced that in two concentrated shots, the turnpike authority has solved a substantial part of Jersey City's shoreline rat problem.

• **Three factors in saving**—Only in three notable instances were there factors that resulted in reduced costs. First, with 3,500,000 cu yd of fill material needed for embankment in the Caven Point area, one unit price bid was $1.27 per cu yd, as against that of the nearest competitive bidder, whose unit price was $1.58 per cu yd.

The saving amounted to more than a $1 million, with Geo. M. Brewster & Sons, Bogota, N. J., awarded the prime contract on the low bid. That firm sublet the contract to a joint venture team composed of Gahagan Construction Corp., and Eastern Engineering Co., both of New York City.

As it turned out, all other firms who bid on the work were quoting dry-fill prices, while Brewster bid a hydraulic fill operation. The price quoted even allowed payment to Jersey City for disposal of undesirable material from New York Harbor in city-owned tidal areas. The resulting deepening of the harbor was supplemented by placement of more than 1,500,000 cu yd of muck fill in sub-marginal tidal land, which might precipitate waterfront development. The contractor was spared the expense of barging the material to remote points or out to sea.

Jersey City is content, because in addition to receiving revenue for use of the land, it can—after the material has dried and stabilized—develop it or sell it as desirable commercial property.

The work was accomplished in just two setups of the dredging equipment, one for the harbor mucking and the other for the fill operation. The fill material, most of it pumped to the Caven Point interchange area, is as deep as 30 ft in some sections.

Another point of savings was the low ($135,000) cost for house-moving

Tilt-up and lift-slab construction becomes even more practical with clean-breaking, nonstaining

HORN PARTING COMPOUND

Horn Parting Compound is a special product specifically formulated for use with this economical method of concrete construction. Unlike other curing compounds, it leaves no oily residue to interfere with paint or asphalt tile adhesives. Nor does it prevent proper penetration of chemical hardeners. Contains no wax, fat or paraffin, and is stable in the container. Keeps discoloration to a minimum. Residue will disintegrate, or can be easily removed, leaving a surface suitable for chemical hardening, installation of asphalt tile, or painting with oil base, resin emulsion or latex base paints.

For complete specifications and prices, write A. C. Horn Company, Inc., Dept. H20-69

Building: Schaub's Market
Temple City, Cal.
Engineer: F. Thomas Collins
Builder: Emile Wohl & Co.

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A. C. Horn Co., Inc.

10th Street and 44th Avenue, Long Island City 1, N. Y.

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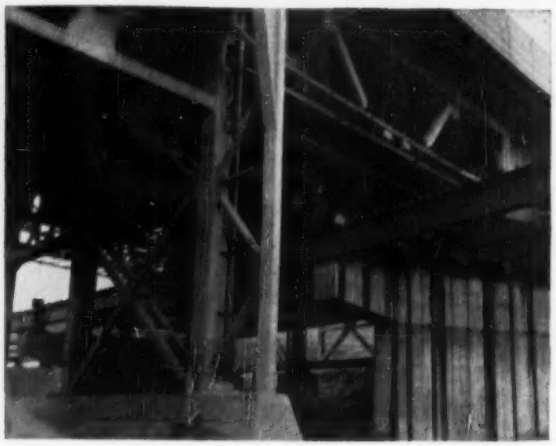
. . . Newark Bay Bridge had a one year lead

Over—Approach to the Holland Tunnel is an elevated structure that goes high in the air, to clear a railroad mainline.



. . . And Under—Ramp from the tunnel goes under main public highway approach forcing reconstruction of viaduct trusses.

and demolition. A possible reason for the low bid is the high percentage of salvagable residential buildings. These were moved to new foundations not far from the original locations.

The third factor in cost saving is offered as a valuable intangible by contractors and engineers along the route. The five railroads (The Lehigh Valley, The Pennsylvania, The Central of New Jersey, The Erie and the New York Central) have been steadfast in their cooperation and assistance in construction of what might be classed as competition.

The Lehigh Valley Railroad, in one representative instance, rushed to completion a relocated spur line to facilitate steel movement to one isolated section of a viaduct.

• **Early bridge start**—The long Newark Bay Bridge was placed under construction a year before any of the rest of the project was started. From a 500,000-cu-yd fill—brought in by truck and rail—at the Newark Airport interchange on the main turnpike, the bridge rises to a channel span clearance of 135 ft above mean high water of the bay. The channel span is a steel tied-arch structure with 650 ft clearance between channel piers.

Approaches to the channel span are land and river piers rising as high as 100 ft. Land pier construction was handled by Merritt-Chapman-Scott of New York City and Charles F. Vachris, of Brooklyn, New York.

Both companies used the same techniques in placement of column concrete. Multiple-use knock-down forms were built so that two sides could be installed at a time. With two sides in place and rigidly stiffened, the reinforcing cages were ground-fabricated of 1¼-in. bars and hoisted into position by crane. Then the other two sides were clamped tight to complete the formwork. All pier columns in sections constructed by these two companies were cast continuously in a single lift, with very satisfactory results.

Twenty river piers were built by Dravo Corp., Pittsburgh, using conventional four-side solid forms and placement of successive lifts in each pier column. River and approach piers are U-type bents, and viaduct bents are a 4-column conventional type. One structure, near the Bayonne interchange, is 2,600 ft long.

Anchor spans on the main bridge structure were erected from falsework with material barged to the site, and the big trusses were reamed assembled. With anchor spans in place, erection was conventional cantilever operation, with lifts made from carfloats.

The anchor spans are 300 ft long, and to the east and west run girder spans up to 171 ft long. There are 15 spans running eastward to the transition from girder spans to beam spans, and there are eleven running to where the beam spans start to the west.

Silicon steel replaced carbon steel on most of the members, despite a difference of three cents per pound in cost. Multiple-punch facilities were limited to 120-in. material, and the one-third higher allowable unit stress for silicon steel resulted in savings in

Prime Contractors at Bay Extension

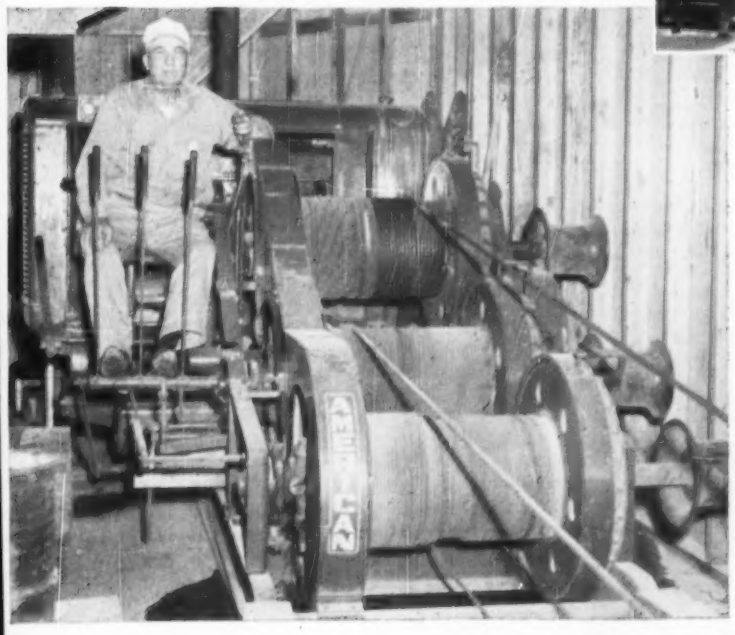
Prime Contractors	Job Nos.	Superintendents
Dravo Corp.	N-1	W. Roy Switzer
Bethlehem Steel Co.	N-2, N-7, N-9, N-14	C. E. Adams & J. McGonnile
Merritt, Chapman & Scott	N-3, N-4	I. H. Wilkes & R. I. Senn
Villa Contracting Co.	N-5	N. G. Redman
Chas. F. Vachris, Inc.	N-6, N-8, N-10B, N-18C	E. Planky
Cayuga Found. Corp.	N-10A, N-26B	S. Chiounard & L. Crosby
Reid Const. Co., Inc.	N-11	S. Shafto
Poirier & McLane Corp.	N-12	F. Suffercoo
Horn Const. Co., Inc.	N-13, N-25-D, N-26A, N-26C	N. Danielson & J. Singleton
Klevens Corp.	N-15, N-19	E. Gelbenz
American Br. Div.	N-16, N-27A, N-27B	J. Murphy
Geo. M. Brewster	N-17	Hap Hoy
P. T. Cox Const. Co.	N-18A	T. Tiernan
Woodcrest Const. Co.	N-18B	T. Goode
Wheeler Engineering Co.	N-18B	T. Goode
Harris Structural Steel	N-20, N-24	U. Laukannen
Fehlhaber Corp.	N-21	A. Burros
Baldwin-Lima-Hamilton	N-22	W. Cartee
Brookfield Const. Co.	N-23, N-25A, B&C	J. Sorenson

Project engineers for Howard, Needles, Tammen & Bergendoff, consultants on the extension, were E. F. Wilcox, J. E. Miller and L. D. Brown.

8-STORY ADDITION STARTS 70 FEET UP!

American Carries the Load

An 8-story addition *on top* of the Federal Reserve Bank of Minneapolis kept an American 3-Drum Hoist in full operation from the first day on the job! Because the 6-story bank building was occupied, all materials for the job, except the steel, had to go up the hoist. As the job progressed, the double-well tower rose to a height of 225 feet! The American Hoist got a real workout on this job—long, heavy hauls clear to the top demanded plenty of steady power and easily controlled clutches. "Dropping" the elevator cars as much as 200 feet meant the brakes had to take hold firmly, smoothly without fail every time! Lives depended on the American Hoist—and profits too, because it was the only link between the ground and the job! Here's what went up on the American Hoist: 4,000 yards of concrete; 1,000,000 bricks and tile pieces; 6,000,000 pounds of plaster; 5,000,000 pounds of Indiana limestone; 1,000 windows, and 1,000 spandrels—plus equipment and materials for plumbing, heating and air conditioning!



It's workhorse dependability on big jobs like this that makes American the number one choice of contractors! Your distributor has all the details about the complete hoist line that starts with capacities of 3,000 pounds single line pull!

AMERICAN 3-DRUM HOIST used by general contractor, Naugle-Leck of Minneapolis during construction of the 8-story bank addition.

AMERICAN HOIST
and Derrick Company
St. Paul 1, Minnesota

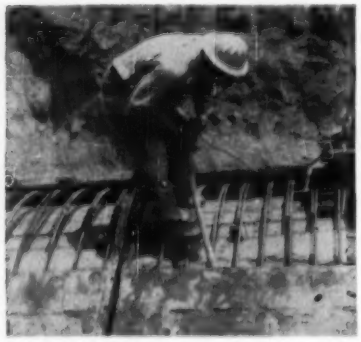
THE COMPACTNESS and lightweight portability of UniViber makes it easy for one man to handle . . . small size makes it easy to transport in trunk of ordinary car.

Extra Man Eliminated by Using UniViber Plug-in Vibrator

Motor in head design eliminates the hours wasted by workman dragging motor after the operator and provides greater flexibility in job application.

Motor in Head

UniViber power is a universal type motor connected directly to the eccentric weight it rotates. It may be plugged into any standard 115 volt AC or DC source. The motor is cooled by wet concrete surrounding the head. Speed approaches 10,000 rpm. More work can be done in less time, and with minimum danger of damage to forms by using the high speed low amplitude type of vibrator pioneered by VIBER.



Particularly adaptable for use in hard-to-reach places, UniViber may be tossed into the concrete and pulled back toward you . . . the UniViber vibrator manipulates effectively and easily by using the casing as a handle.

Greater Flexibility in Operating Techniques Reduces Costs

Wires leading to the head are protected by a flexible casing which also functions as a convenient handle. The easy-to-handle UniViber vibrator gives the workman more freedom of action because absence of moving parts in the casing allows increased flexibility. This new freedom enables the operator to employ new cost saving vibrating techniques.

Two Models Available

UniViber Model 1M3R is equipped with the Viber patented replaceable rubber tip. Model 1M3 has housing with steel nose. One piece VIBER patented eccentric weight is tapered to produce minimum vibration where brushes ride on the commutator. Another feature is splash lubricated non-metallic separator bearings, used so successfully in other VIBER vibrators.

VIBER COMPANY is a pioneer in the design and development of both internal and external vibrators. For further information on VIBER'S complete line of vibrators, contact your authorized distributor or Viber Company, Dept. 7D6, 726 So. Flower Street, Burbank, California.

VIBRATORS SINCE 1931

. . . Newark Bay Extension

fabricating cost and substructure construction. Furthermore, use of the material allowed design of flanges of reasonably small cross section.

• **Hot aggregate job**—During cold months, all concrete used on the project contained heated water and aggregates with batch-plant temperature controlled at 60 F. Both forms were insulated and the top covered.

The most important factor in using heated aggregates, according to project engineers, is the use of slump only as a means of mix control. Relying on water-cement ratios produce unsatisfactory results, but by maintaining slump limits at 1 to 2 in. for paving, up to 3 in. for substructures and not more than 4 in. in decking, quality of concrete was maintained at better than specified levels.

A retardant was used during warm weather casting, when continuous concrete placement over three spans was common. Average paving volume ranged from 250 to 400 cu yd per day, and on the best day, crews placed more than 420 yd.

• **Will high cost pay off?**—In justifying construction of the extension in the face of tremendous cost, Paul L. Troast, chairman of the New Jersey Turnpike Authority, cited a few of the considerations:

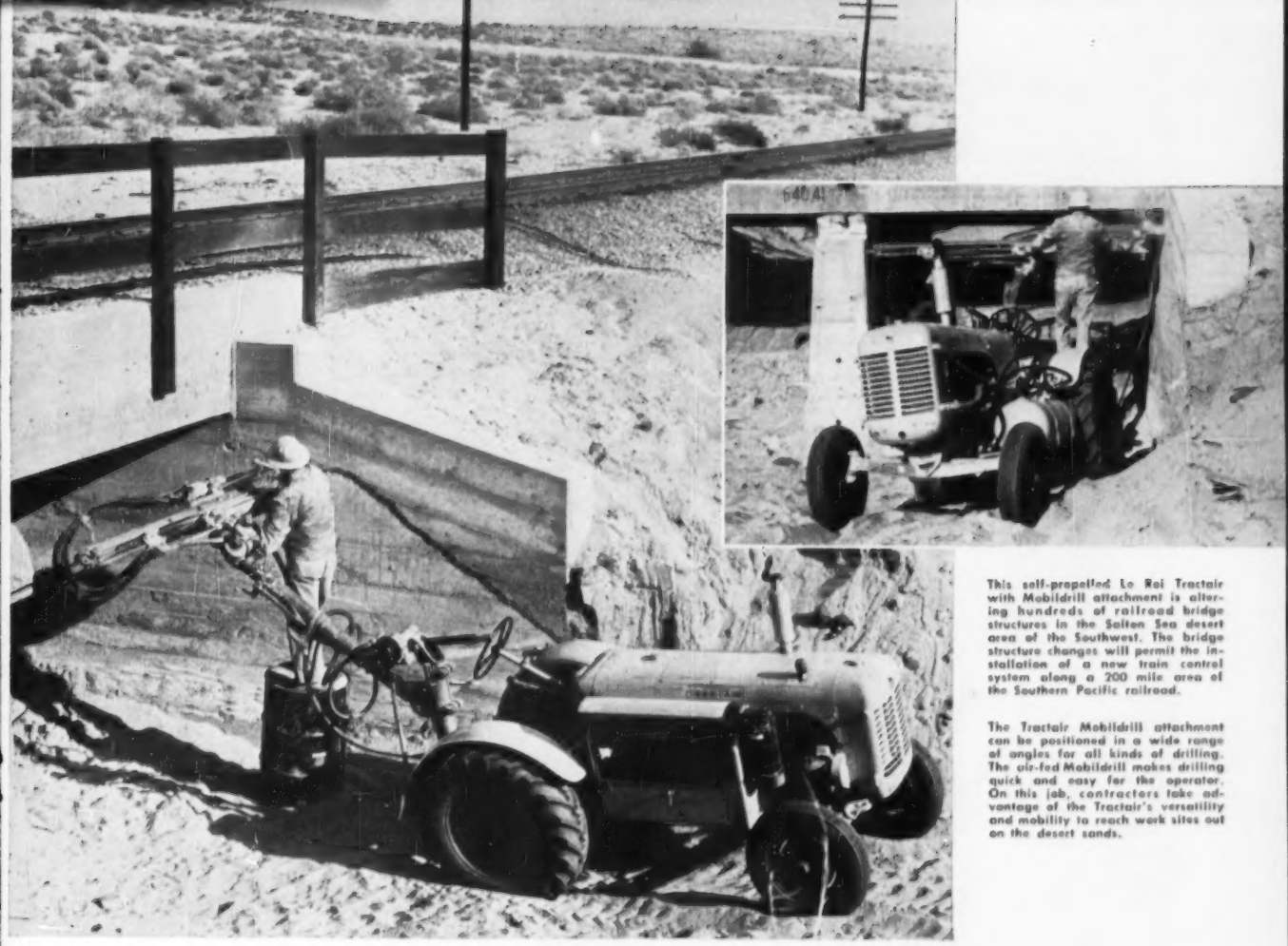
1. Aside from considerable relief from present congested public highway conditions, the newly opened section alone will cut in half the present travel time between Newark and Bayonne.

2. When the remainder of the extension is opened this summer, it will cut travel time between the Newark Airport interchange and downtown New York City to less than 20 minutes, a tremendous saving over present time.

3. The extension will open for development the last waterfront area in Greater New York Harbor—that portion in New Jersey that has been almost inaccessible up to now.

4. A new and direct route from New York City to Newark Airport will be established.

5. Surveys by Coverdale and Colpitts, traffic consultants, indicate that during the first full year (1957) of total operation the extension will serve 15,000,000 vehicles. It is estimated that about 73% of passenger and commercial traffic will originate, or have its terminal point, in the Hudson County Peninsula. Only the remaining 27% will go to, or come from, the Holland Tunnel and New York City.



This self-propelled Le Roi Tractair with Mobildrill attachment is altering hundreds of railroad bridge structures in the Salton Sea desert area of the Southwest. The bridge structure changes will permit the installation of a new train control system along a 200 mile area of the Southern Pacific railroad.

The Tractair Mobildrill attachment can be positioned in a wide range of angles for all kinds of drilling. The air-fed Mobildrill makes drilling quick and easy for the operator. On this job, contractors take advantage of the Tractair's versatility and mobility to reach work sites out on the desert sands.

How Railroad Uses Tractor-Compressor to Lick 200-mile Job in Desert Sands

Drilling rig mounted on combination unit, speeds from one working location to another.

Le Roi Tractair mobility not hindered by the dry, loose sand.

On the job, Mobildrill swings easy, gets into tight corners, saving hours in weekly drilling time.

Shifting sands of the desert pile up some equipment problems on the new train-control system project now under way between Colton, California and Yuma, Arizona.

The T. M. Page Corp., subcontractor on the 200-mile project says, "We found an answer in the Le Roi Tractair. It's one machine able to crawl through this very loose, dry sand under its own power. It's versatile. Most of the other machines need a crawler tractor to get them in and out of the work sites."

The Tractair with its air-fed Le Roi-Cleveland Mobildrill attachment is drilling hundreds of concrete supports for alteration of bridge structures. The Mobildrill makes drilling easy for the operator, as it can be swung to a variety of angles for all kinds of drilling.

Because Tractair is a combination 125-cfm air compressor and a 42-hp wheel tractor in one self-contained unit, it can be equipped with a wide variety of attachments. These include a front-end loader or a backhoe, plus dozens of accessories and air tools for most any need.

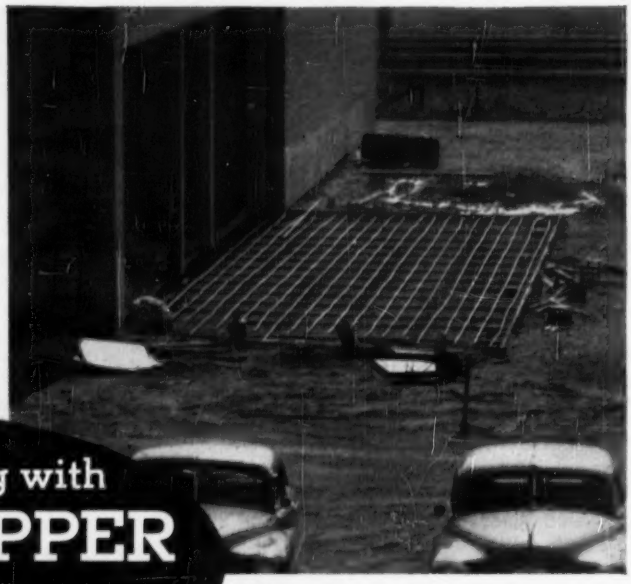
Three other Le Roi compressors are used on the project. "Perfect" service for all four Le Roi machines is provided by the distributor, according to the contractors. All of the Le Roi units work 8 to 9 hours each day in the hot climate.

T-52

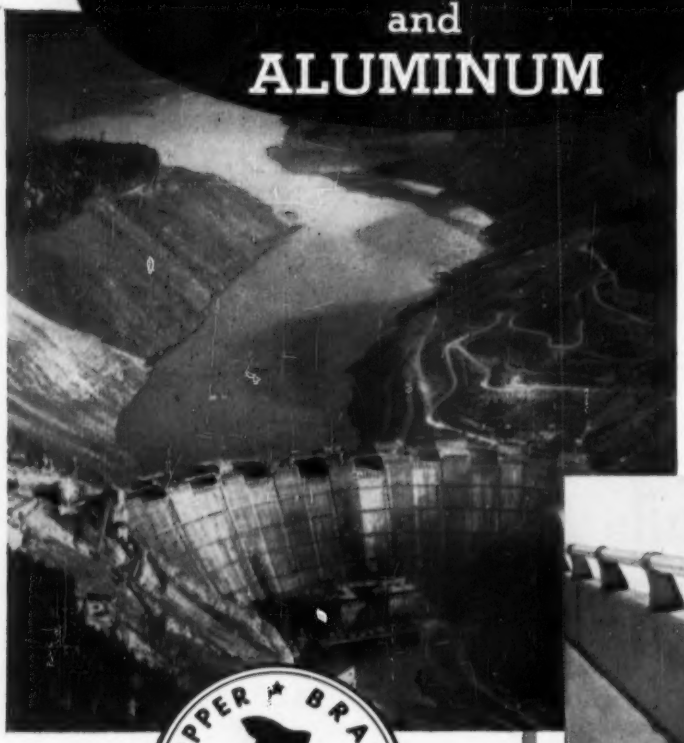
LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

Shown here are four of the many, many ways that Revere Copper and Aluminum are being used in the construction field. In this type of work both designing and construction engineers have found that Revere's Technical Advisory Service is often very helpful. In the case of the Hungry Horse Dam shown directly below, the compound expansion and contraction of the concrete necessitated an elaborate system of copper joints. Revere Technical Advisors worked with the engineers to obtain the best possible system of joints. It is this kind of assistance, backed by a storehouse of knowledge spanning 155 years experience in working with non-ferrous metals, which may prove useful in the projects now on your boards.

what they're doing with REVERE COPPER and ALUMINUM



THERE WILL BE NO SNOW OR ICE on the concrete entrance apron of this warehouse of "Junket" Brand Foods, Little Falls, N. Y. Revere Copper Water Tube is ideal for snow-melting. Its light-weight and 60'-length coils make it easy to handle and install. Its soft temper permits bending, thus reducing the number of fittings used and its non-rusting characteristic makes it the logical answer for use in concrete.



HUNGRY HORSE DAM, Montana. On this $108,000,000 project more than 200,000 lbs. of 24 oz. Revere Soft Resquared Copper Strip were used as water seals. Engineers on the job chose copper because of its overall economy, its ease of handling in installation, its outstanding flexing qualities and its resistance to corrosion.

THIS BRIDGE RAIL of Revere Seamless Aluminum Tube is but one example of the wide range of sizes, alloys and tempers which Revere has available, bringing to the construction industry the advantages of light weight, corrosion resistance, strength, pleasing appearance and with economies to the manufacturer.

THE USE OF ALUMINUM LIGHT STANDARDS is growing by leaps and bounds. Makers of these standards use many Revere Aluminum Extrusions because they know how great a difference may exist between the design of a new shape on paper and the delivery of a fine extrusion in aluminum. They come to Revere for the experience and service needed to bridge this gap. For help on *your* specific extrusion problem, call the nearest Revere office and ask for a "TA" (Technical Advisor).

COPPER ★ BRASS 18 01 ★ REVERE ★ ALUMINUM

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New Products

Electric Hammer Introduced For Chipping, Battering

A new lightweight, but powerful, electric hammer for maintenance and construction work has been announced by Ingersoll-Rand.

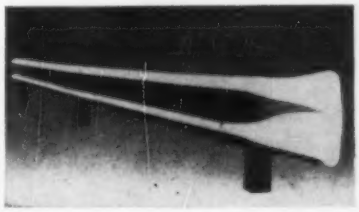
The company says the hammer is for use in star drilling, demolishing, piercing, breaking, channeling, battering, chipping, caulking and the like.

Weighing only 12 lb, 13 oz., the tool is said to be easier to handle yet provides more power per pound than similar machines. It will drill holes in concrete up to 1¼ in. in diameter. The tool is available in a standard kit, with a choice of three packaged accessory kits, or individual accessory items may be purchased as desired. INGERSOLL-RAND, 11 BROADWAY, NEW YORK CITY.

Attachments Convert Tractor Into Backhoe, Backfiller

The recently announced development of a combination backhoe and backfill blade attachment now makes possible the conversion of an International 300 tractor into a low-cost combination to handle many trenching jobs.

Both attachments are attached to a husky sub-crane, providing a sturdy mounting which relieves the tractor itself of heavy loads. The hoe is a complete self-contained unit and can be removed or attached in less than 30 min, the manufacturer says. The effective digging depth of the hoe is 11 ft, and because it is able to dig and dump in a 190-deg radius, it may



Highway Guard Rail

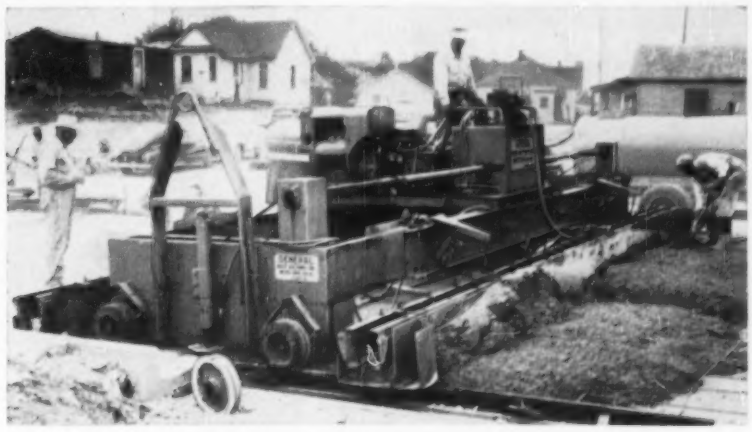
A new deep-beam standard highway guard rail is now available in 10 and 12 gage sizes. Known as "Protecto-Beam," the new rail is said to meet standard specifications for beam-type highway guard rail. Syro Steel Co., Girard, Ohio.

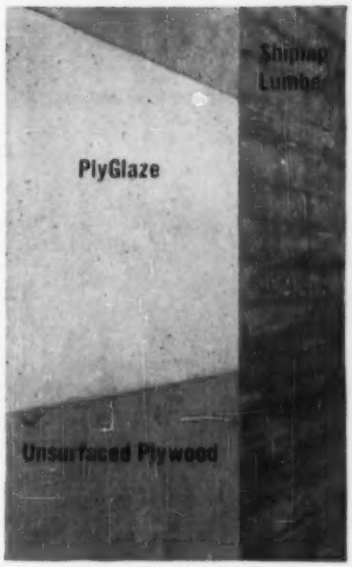
Portable Screed for Wide Slabs

A new portable compacting screed finisher for use on 20- 32-ft-wide concrete slabs, is now available from General Road Machines Inc.

Designated Model 5-S, the new machine can provide increased pavement production and lower operating costs, says the manufacturer, because its two 16-in.-wide screeds produce a smooth finished surface in one pass, at rates of up to 18 ft per min.

A range of 6 travel speeds and 24 screed speed combinations permits selection of the finishing rate best suited to individual job requirements. Instant reversing, full hydraulic control of front and rear screeds, plus easy interchangeability of track wheels and positive drive on all four wheels also contribute to the operating efficiency. A side advantage is that roadform life is increased because the smooth operation of the finisher prevents form damaging rocking and twisting. GENERAL ROAD MACHINES INC., NILES, OHIO.





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READ "finest" both ways: PlyGlaze *itself* has the finest, smoothest surface of any form material; PlyGlaze-formed *concrete* surfaces are the finest—smooth, even-textured, with no trace of grain pattern. Savings on finishing costs alone frequently offset slightly higher cost of this premium material. See Sweet's File or use coupon for more information.

TREE LIFE FOREST PRODUCTS
Another member of the famous Tree Life Family of Forest Products
Hard, glossy-smooth wear resistant fused resin-fiber surfaces.
Top-quality Exterior plywood (EXT-DFPA). Standard panel sizes.
PLYGLAZE EXT-DFPA

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Dept. INR, Tacoma 2, Wash.
Please send free PlyGlaze literature.

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Address _____

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TO START YOUR FREE "NELWELDER" SUBSCRIPTION

Complete photo of this Texas cowhand appears on the front cover of the July NELWELDER, industry's magazine of stud welding.

NELWELD

when you're talkin' studs..

NELSON IS YOUR BRAND

Fixin' to cut product costs? Building costs? Then round up your designers and steer them toward end welding studs to steel, NELSON style.

From securing cover plates on a product to the fastening of industrial roofing and siding materials on a building, the NELWELD® method can save you big money. The studs are available in a wide range of shapes, and in sizes up to 1 inch diameter.

Corral your local NELSON field engineer, Pardner, he's a right smart hombre when it comes to studdin' around for fastening short cuts. Get on the mailing list pronto for the NELWELDER. Sign up in space above.

NELSON STUD WELDING
Division of Gregory Industries, Inc.
LORAIN, OHIO

be worked in extremely cramped quarters. On the forward end of the subframe, a sturdy 6-ft backfill blade is mounted, and can be raised and lowered hydraulically a distance of 18 in. above the grade to 8 in. below grade. WAIN-ROY CORP., HUBBARDSTON, MASS.

Self-Propelled Small Crane Uses Size to Good Advantage

Now in production is a ½-yd self-propelled yard crane which, according to the manufacturer, offers many advantages over larger equipment and other equipment in its own field.

The machine has a low center of gravity, therefore less tipping action, has no hook rollers, and operates on a patented ball-bearing turntable. The single-engine self-propelled machine is equipped with hydraulic steering, hydraulic power braking, has a two-speed four-wheel drive, and will turn in less than a 60-ft circle.

Designed for operation in cramped quarters by one man, travel and steering is also actuated by the operator. LITTLE GIANT CRANE & SHOVEL, INC., E. 16TH & HOWARD DRIVE, DES MOINES 13, IOWA.

Valve Actuating Device Offers Balanced Control

The Ledeen Quad Actuator has been introduced to operate high-pressure plug and ball valves up to 36 in. in size. Four-cylinder operation is claimed to deliver balanced torque to the valve stem. For periodic testing, a detachable lever permits operation of the actuator and controls without turning main valve. The device is available in a wide range of torque capacities, with a variety of control systems. LEDEEN MANUFACTURING CO., 1600 SO. SAN PEDRO ST., LOS ANGELES 15, CALIF.

Stabilizers Added to Plow For Cable-Laying Stability

Stabilizing skids which resemble the wings of an airplane have been added in a new model cable layer now available from Pemco. The use of these skids is said to prevent the plow from rocking, and also to keep it from digging in.

The plow, according to the manufacturer, will lay cable under almost any conditions. It is 8 ft long, weighs about 800 lbs, and is handled readily by two men while a third feeds the cable. PHILADELPHIA ELECTRICAL AND MANUFACTURING CO., 1200 N. 31ST., PHILADELPHIA, PA.

FOAMGLAS®

the cellular, stay-dry insulation

Now celebrating their 60th anniversary as a maker of top-quality print cloths, twills and broadcloths . . . Clinton Mills' broad textile manufacturing experience led them to rely on stay-dry FOAMGLAS to furnish dependable insulating protection for this 1300-loom weave room.

J. B. Templeton, Production Vice President, Clinton Cotton Mills, Clinton, S.C., reports . . .

"FOAMGLAS roof and wall insulation stays dry, helps stabilize temperature-humidity to lower operating costs in this weave room"

When warp and filling yarns dry out and break, textile looms shut down. That cuts loom efficiency and boosts operating costs. The answer is constant, accurate temperature-humidity control to keep yarns workable. For such control, dependable insulation is a must!

"We picked FOAMGLAS to insulate roof and walls of the new 1300-loom weave room added to our Clinton, S.C., mill last year," says J. B. Templeton, Production Vice President of Clinton Cotton Mills. With its structure of closed glass cells, FOAMGLAS can't absorb moisture and lose efficiency as other insulations do. It stays dry and effective.

Mr. Templeton concludes: "FOAMGLAS aids in maintaining dependable temperature-humidity control. Yarn fibers stay moist, workable and free from static electricity. Condensation on weave room walls and ceiling is eliminated. Our looms operate at or near rated capacity with minimum shutdowns."

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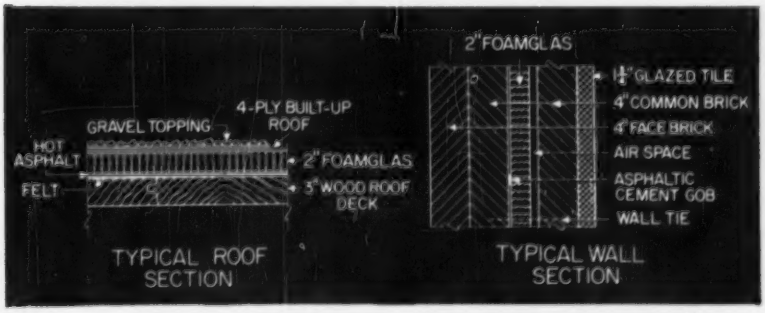

Drawings show application of FOAMGLAS on roof and walls of Clinton Mills' new weave room. Since the insulation prevents condensation, there is no danger of moisture damage to walls, roof, window frames or floors.

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Bertram D. Tallamy (center) is one of the men who has helped U. S. highways keep pace with the traveling public. He's . . .

Taskmaster for New York's Thruway

From the moment Henry Ford put his first Model T on the road in 1908 and opened up the motor age, the states have had a problem: How to provide better roads.

One of the men who has helped highways keep pace with the traveling public hangs his hat in a one-story brick building in the Albany, N. Y., suburb of Elsmere. He is Bertram D. Tallamy, 55, dapper boss of the New York Thruway—the world's longest tollroad system.

During his 30 years as a civil engineer, hustling Bertram Tallamy has had a hand in most major projects carried out by the State of New York. As chief engineer of the Niagara Frontier Planning Board he spearheaded much of the scheming to modernize the highway system. As superintendent of the State Department of Public Works he was the guiding force on a record-breaking $670-million postwar building program. And now, as chairman of the Thruway Authority, he is taskmaster for construction and operation of the 562-mi "Main Street of the Empire State."

Tallamy looks upon the Thruway as his major undertaking. And today—at a time when the red light is flashing on turnpike construction and money troubles are plaguing some of the new super roads—he is confident of the Thruway's financial soundness. And he's more convinced than ever of its growing importance to the state and the entire Northeast.

"Good roads pay for themselves." This sums up one of Tallamy's basic highway philosophies. It also is a reminder that the Thruway has a lot to live up to: A $1-billion pricetag.

"We're not in business to make money," says Tallamy, "but to charge just enough to run a good sound business enterprise." At present, close to 75% of the Thruway system is complete, including 424 miles of the main 427-mi section from Buffalo to the New York City line. And when finishing touches—138 miles and $297 million worth—are put on the network, he believes it will easily bring in the $35-million gross revenue predicted for 1965.

"Truck traffic always will be a principal financial pillar of the Thruway," says Tallamy. "If you consider a normal year when the entire Thruway system is in operation, we expect truck revenues to make up 40-50% of the total."

But he points out that the percentage of truck revenue as compared to total revenue will fluctuate considerably, depending upon many factors.

"During periods of great prosperity passenger car travel will rise above what would be considered normal but truck traffic will increase still more. Under such conditions it is likely that commercial revenue will approach noncommercial revenue. There also are seasonal fluctuations when a tremendous surge of pleasure travel will tend to decrease the ratio or percentage of commercial traffic.

"In time of war or national emergency it is possible that pleasure traffic would be curtailed, with the result that truck revenues would exceed passenger car revenues."

• **Forecast for tollroads**—Tallamy believes that the number of motorists who are willing to pay for better roads is on the upswing. But he is well aware that there has been a growing tendency to look upon the tollroad as a substantial part of the answer to the national highway problem.

Last December he told ENR: "To attract private investors, tollroad self-liquidating features must be provided in advance of their construction through painstaking traffic and revenue studies—and most highways with these features already have been staked out as tollroads. It is unlikely that any considerable portion of our national highway needs could be filled through the pay-as-you-ride principle."

Today his forecast of the tollroads' future takes on the same tone. "With passage of new federal highway legislation practically guaranteeing early construction of the interstate system,

(*Continued on page 52*)

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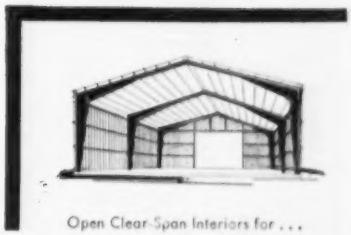

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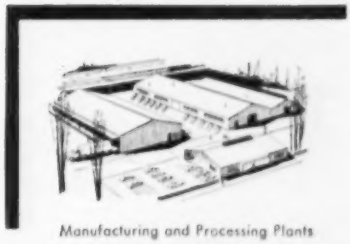

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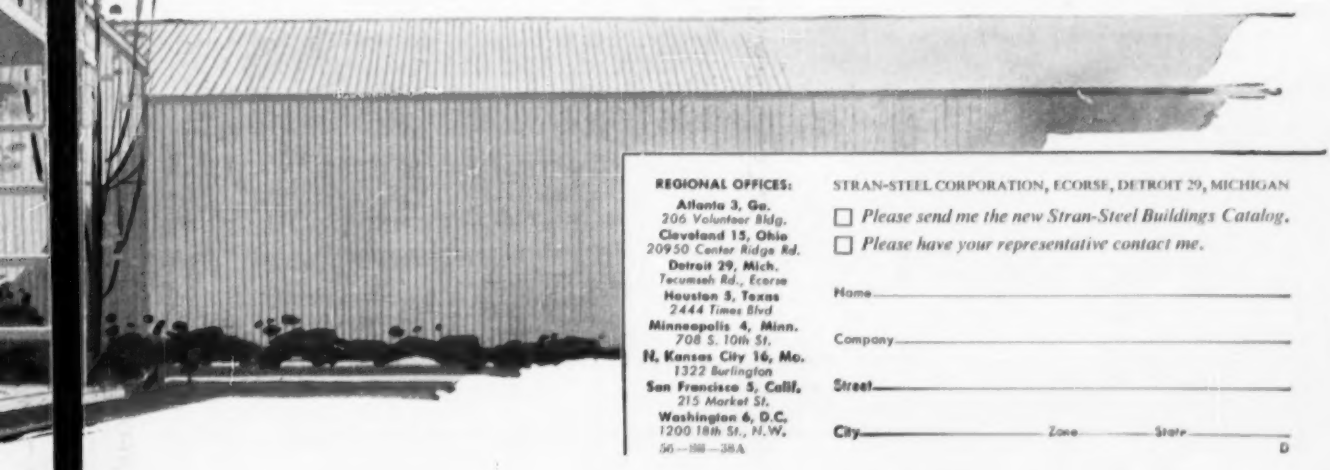

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I doubt if much additional tollroad construction will be necessary for quite a few years to come. There may be short pieces in metropolitan areas that would lend themselves to toll financing, but the mileage of new tollroads will be very limited in the foreseeable future."

One remedy that has been prescribed for curing turnpike ills is setting up uniform rates on all toll facilities. Tallamy doubts if this could be accomplished. "Toll rates depend on a number of factors, including costs of construction, operation, maintenance and financing. They also depend on savings made possible by using the turnpike, as opposed to parallel routes. Since these vary with each turnpike, it appears unlikely that any uniform rate for travel will be established, at least for a long period."

But—no matter what is in store for tollroads—he emphasizes one thing: Transportation has been the keystone of progress since the earliest civilization. And the Thruway, following a historic route of continental travel, is a prime example of transportation progress.

Groundwork for the Thruway route was laid in the glacial age, when waters from the receding ice sheet burst through the Appalachian Mountains around Little Falls, N. Y. The giant outflow carved out the Mohawk and Hudson valleys and created the most direct and accessible way through to the Midwest.

This traditional water-level route was the setting for the Iroquois Trail. Next, the pre-Revolutionary Kings Road followed its course. Years later, ground was broken on the same spot for the Erie Canal. Then the New York Central Railroad pushed along the Hudson and Mohawk banks. Finally, little roads linking river towns merged into two main routes. And when the traffic tempo picked up to a point where overcrowding couldn't be overlooked, superhighway plans materialized.

The route of the Thruway tells the story of the past. But it also holds a key to the future. Says Tallamy: "There's a dividend that is more important than the fact that the Thruway is paying for itself. That big dividend is development."

The tollroad already is luring industrial settlers. Tallamy points it out: "Factories, industries, sub-divisions are springing up almost like magic. The primary cause is transportation facilities afforded by the Thruway. So far, industrial and commercial development is confined mostly to interchange regions. But it radiates out according to highways in the area—and it will permeate farther back with a better interstate system."

CHECKING ON THRUWAY PROGRESS keeps Tallamy traveling 1,000 miles a week during summer construction peaks.

He is quick to bring up another dimension of this development. "It's aiding in the problem of decentralization for national defense. Industries can locate along the Thruway and draw manpower from the city areas. In this way, it's not nearly as costly an operation because water, sewerage, electrical and gas utilities, streets, storm water drainage and other facilities existing in city areas do not have to be duplicated at great expense in the vicinity of rural factory sites."

• **The homestretch**—But taking stock of the industrial sidelight is like looking at the frosting on a cake. The basic chore before Tallamy and his aides is completing the Thruway. In many ways construction is heading down the homestretch. But there are still some big jobs—connections to neighboring states—to wind up:

• The 24-mi Berkshire route to the Massachusetts Turnpike, to be completed by the end of 1957 or early 1958.

• The 23-mi Niagara link from Buffalo to Niagara Falls, to be finished by late summer, 1958.

• The 70-mi Erie section from Buffalo to the Pennsylvania border, to be substantially completed this year.

• The 15-mi New England link to the Connecticut Turnpike, to be finished by spring of 1958.

In addition, the new Grand Island Bridge across the Niagara River between Buffalo and Niagara Falls will be placed under contract within a year and finished in 1959. And the final three miles through the city of Yonkers to the New York City line are scheduled for completion this year.

To keep tabs on construction progress Tallamy travels anywhere from 1,000 miles a week during summer work peaks to 750 miles in the winter. And since the first Thruway section opened in June, 1954, the problems of operation and maintenance have stepped up his workload.

The Thruway maintenance staff, which has leapfrogged to 641, has been revamped into three groups: Highways, structures and buildings. Its toughest assignment has been protecting motorists from extreme weather conditions common to most parts of upstate New York. Another Herculean task is handling the main section's 507 major structures—including the three-mile Hudson crossing between Nyack and Tarrytown.

Operations has become a big business, too. Toll taking—complicated by the use of $20 annual permits by New York passenger cars—calls for a specially schooled staff of 477 to tackle the wide variety of transactions. In addition, the Thruway finances a special 130-man detail of state police. And it has its own growing communi-

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• **U. S. road problem**—The Thruway project is a time-taking one. But Tallamy has not confined highway interests within New York state boundaries—a fact noted by the University of Buffalo last year when it cited him for leadership in his field. He looks upon highway needs as the foremost domestic problem in the U. S. And he hasn't hesitated to take part in national highway planning or to champion road causes before Congressional committees.

What is the key to future improvement of highways? Tallamy believes that there must be recognition at all government levels of the vital importance of highways and of the necessity of maintaining them adequately to protect the enormous investment they represent. "The highway network must be maintained and expanded to protect the very foundations of our way of life. Responsible officials must recognize that our transportation system cannot stand still and at the same time nourish an expanding economy. After these basic principles are recognize that our transportation sysing the necessary financing must be found or created."

He regards federal highway legislation as a bold and forward step toward the goal of an adequate highway system. "A great many people will quibble over details, but I do not believe this is the time to do so. The salient fact is that—forgetting details that may be objectionable to one group or another—the forces seeking better roads have won the most substantial victory since the first federal aid highway legislation."

Roads, says Tallamy, should be as free as possible of inconveniences and their use should be made as economical as possible. "Historically, our highway system has been a 'free' system, but there is no such thing as a free road, bridge or tunnel. Whether they are financed by taxes or tolls is largely dictated by local conditions or circumstances at the time when a new project is needed. Highways must not be delayed because of an idea or philosophy that they should be financed in one or another specific way. They are too vital to neglect or put off because of stubborn adherence to a particular philosophy or financing concept."

Tallamy himself has felt that bonds were a partial solution to financing the national highway program because they would shorten construction time. "The period of construction should be kept to a minimum. I personally think it should be done in 10 years even if it means resorting to the sale of bonds. The impetus to commerce and industrial expansion, to agriculture—as well as savings on wear and tear of cars—more than offsets carrying charges of bonds."

He also was a staunch supporter of the original highway bill provision that called for reimbursing states for tollroads that met interstate-system standards. He points out that New York stood to gain at least $600 million under the clause. "A forward-looking state—one that solves its own problems—shouldn't be penalized by the federal government. The money should be returned for development of added highways in New York."

Tallamy doesn't think the engineering shortage should affect the road program to any great extent. "True, officials charged with road construction programs will have to use ingenuity in conserving professional engineering manpower. This can be done by using it only for the most difficult elements of the program and employing skilled technicians—not necessarily professional engineers—in those phases of the program for which they can be satisfactorily and readily trained."

He also sees a great opportunity to conserve both professional and non-professional manpower through the use of modern photogrammetry equipment and electronic computers as well as other office devices.

"The engineering shortage—after an adequate period of time necessary to swing into the new program—will be used only as an alibi by ineffective administrators who are too lazy or lacking in foresight to cope with the problem," says Tallamy. He adds: "The highway program outlined in the federal legislation is a cinch compared to engineering and construction work the U. S. undertook in mobilizing for World War II—and with fewer engineers than we have today."

To young engineers just starting out on careers he offers this advice: "Look over the field carefully—including public works—before being enticed precipitously into positions that may pay fabulous starting salaries but may not offer the satisfaction or interest that are inherent in public works improvements."

• **Role of public works**—It's Tallamy's belief that no other function of government in our time is greater in importance than public works. "We would not survive today without adequate public works at all levels of

government." He emphasizes that without public works "the health of every citizen would be in grave danger from polluted water supplies or lack of proper sewage disposal systems . . . cities would starve within a few days for lack of transportation . . . large segments of the nation would be without electric power . . . and the whole civilization we know would grind to a halt."

The biggest gap in public works programs he knows of today is the lack of coordinated long-range planning. "Progressive industries and commercial institutions have adopted what we now call long-range planning in their operations. But until recently very few public works agencies had definite long-range plans for construction and financing of public works."

He points out that the need for new public works can be forecast for reasonable periods and plans prepared to be undertaken at definite scheduled intervals. "To do so calls for careful review of all physical factors and of the financing problem. If proper planning is done, there is plenty of time for acquisition of right-of-way before an increase in value makes it almost prohibitive. Financing, too, can be meshed in with other needs for public funds so that a public works program does not become a program of expediency where one urgent project must give away to another more urgent one."

He also stresses the fact that there is a great need for preventative maintenance on public works projects. "It is necessary to plan ahead a careful schedule of maintenance, thereby avoiding 'crash' or emergency maintenance operations, which obviously are costly."

• **Start of a career**—Planning ahead is no novelty to Bertram Dalley Tallamy. Both his father and grandfather were general contractors—and family interests guided him into his career. In the fall of 1921, when it came time to leave his home town of Plainfield, N. J., for college, Tallamy already had made up his mind to become a civil engineer.

Right after graduation from Rensselaer Polytechnic Institute he plunged into construction work for private companies in western New York. Four years later—in 1929—he teamed up with William F. Sheehan and Wallace V. R. Fretts to organize the Buffalo engineering firm of Sheehan, Fretts & Tallamy.

One example of Tallamy foresight soon paid off for the infant firm. After he left college he studied chemistry

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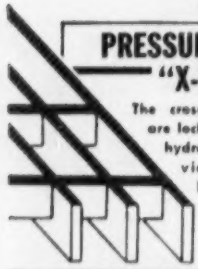

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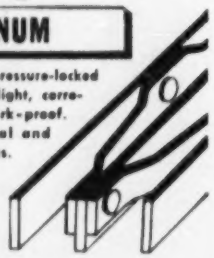

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part-time for two years at the University of Buffalo to facilitate work on water supply and sewage treatment projects. In addition, he took a short course in bacteriology and chemistry at Rutgers University. With this background—and Sheehan's help—he set up a chemical and bacteriological laboratory in the engineering office. Tallamy describes this venture as a "hobby." But it enabled him to make necessary analyses for projects without relying on commercial laboratories.

The mid-thirties inflated Tallamy's duties. He became deputy chief engineer—then chief engineer—of the Niagara Frontier Planning Board. And it was during this period that Thruway plans started popping up in his path. One of his projects was to scrutinize needs for a Buffalo-Niagara Falls expressway and to persuade the legislature to include it in the Thruway system. He recalls: "This turned out to be the Niagara section of the Thruway. And it was born in the Planning Board back in 1941."

• **Challenge from the state**—New York State turned up the next challenge: The job as Deputy Superintendent of Public Works. The state had stored up a large budgetary surplus during World War II. As a result, it created the deputy post to coordinate a giant postwar construction program—a program that included building the Thruway as a free limited-access route.

As deputy superintendent, Tallamy sponsored creation of the Bureau of Arterial Route Planning. At the same time he set up the basic principles and guided preparation of integrated arterial highway systems for major cities in the state. He also handled the state's first analyses of highway conditions and future needs. It was this study that eventually formed the basis for a 10-year, $2.8-billion highway program scheduled by the Public Works Department.

About the time the state's highway and building program reached its first peak—in 1947—Tallamy became chief engineer of the Public Works Department. One of his first major pieces of work was to review standards of design for all expressways, particularly the proposed Thruway.

Then in 1948 Charles H. Sells resigned as Superintendent of Public Works to return to private practice as a consulting engineer. Gov. Thomas E. Dewey named Tallamy to the $17,500-a-year post. Now he was top man for the unprecedented building program and reconstruction of a long-neglected highway and canal system in the state.

The Thruway project, meanwhile, had been taking shape as part of the long-range public works program. But in the crisis-crammed year of 1949 it became apparent that completion would be slowed to a turtle's pace if the state continued to finance it only out of funds that could be allocated from the department's regular highway budget.

Traffic demanded fast action. But where would the money come from? Tallamy came up with an idea: Finance the Thruway independently of the state budget and create a public authority to start immediate construction of the entire project. The work, he suggested, could be paid for through a modified toll system whereby New York motorists could buy special annual permits for Thruway travel.

The state legislature endorsed the plan. And Governor Dewey appointed Tallamy chairman of the new three-man Authority for a term that runs until Jan. 1, 1960.

In taking stock of its assets the Authority found out that it had inherited tentative location and four sections of the Thruway that already had been started by the Public Works Department. It also took over the Grand Island Bridges between Buffalo and Niagara Falls.

But even after it was formally set up the Authority had to figure out a way of getting money to do the job. The legislature and voters of the state helped solve the problem by passing a constitutional amendment to permit New York's credit to be placed behind a maximum of $500 million in Thruway bonds. This would keep interest costs as low as possible.

It was an educational task to win voter approval of the state credit amendment. Thruway men described the proposal to the public – via speeches, movies, radio and television. Tallamy himself took on the job of visiting all upstate New York newspaper editors to tell them about the Thruway program and the fiscal advantages that lower bond interest rates would produce for users of the new road.

Says Tallamy: "We never tried to do a high-pressure selling job. It was just giving the people the facts and letting them come face to face with the pressing needs of the economy and the traveling public." He adds: "The best method of selling the public on highway needs is to simply present the facts pointing to the need for the road—fully and objectively—by means of all available media."

(*Continued on page 58*)

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Either way you look at a pumping job—towards horizontals or towards verticals—follow the lead of consulting and water works engineers everywhere. Select Peerless horizontal and vertical pumps from one of the most complete lines of high quality, water handling pumps offered by any manufacturer.

Remember: Peerless builds dependable pumps for *all* water handling services—supplying, circulating, dewatering, drainage and flood control protection—and for all applications—municipal, industrial, commercial and domestic.

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☐ Peerless Horizontal Pumps (Bulletin B-1300) ☐ Peerless Vertical Pumps (Bulletin B-505)

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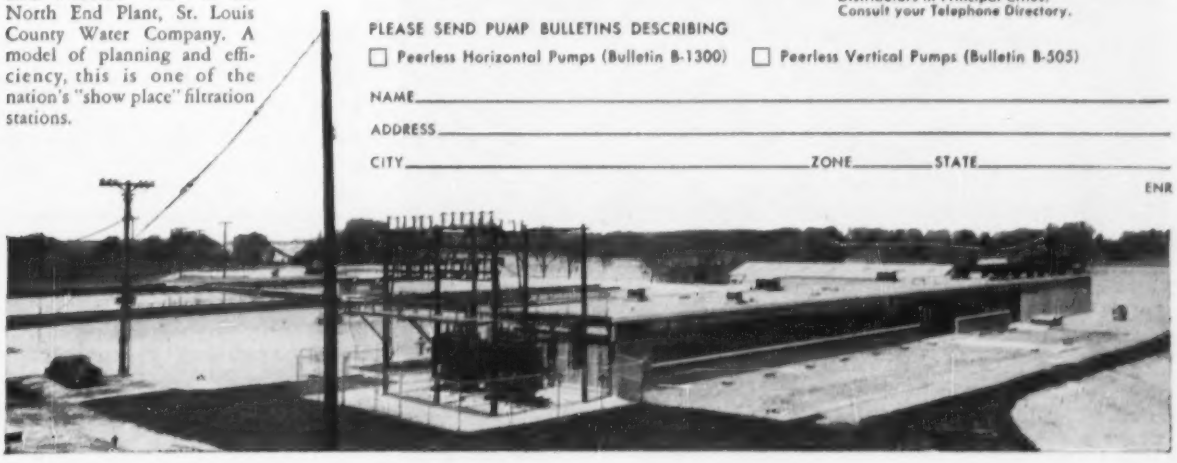
ENR

BIG PLANT—View of the North End Plant, St. Louis County Water Company. A model of planning and efficiency, this is one of the nation's "show place" filtration stations.



WILD®

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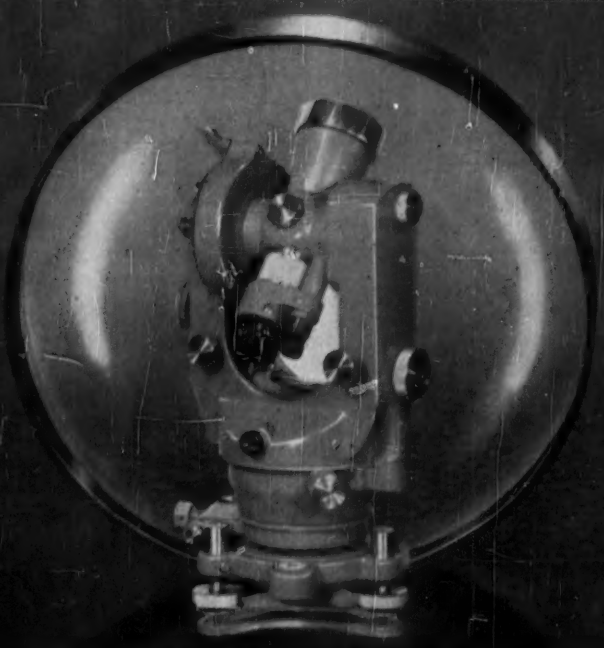

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Here is unmatched speed, precision and convenience. Optically and mechanically, it is designed for fast set-up, error-free reading, maximum versatility, and for day or underground use under the most rugged conditions.

TWO MODELS AVAILABLE

New Model

Reading direct to 20 seconds, interpolation to 10 seconds.

Standard Model

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Priced at $718 and $700 respectively, F.O.B. Port Washington, N. Y. Tripods extra.

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. . . Men and Jobs

• **Eye to the future**–Since November, 1951–when voters gave their nod of approval to the state credit amendment–the Thruway project has become a reality. It already has passed many of its major hurdles. Steady progress is being made on design and construction of remaining sections. And possible new routes are continually under study. (For the Thruway story see ENR, 1953–July 2, p. 38; July 16, p. 51, Dec. 10, p. 37.)

Tallamy, too, has passed a lot of milestones. A big one came in December, 1954, when his term as Public Works Superintendent expired. This meant that he was able to turn full attention to the Thruway and its 1,372 employees. It also gives him a few more free moments for hunting, fishing for trout–and for his hobby of "building things" for his summer home on Big Bowman Lake in Rensselaer County, near Albany. Both Mrs. Tallamy and son Bertram (also a CE graduate at Rensselaer) will testify that he already has converted the house to year-around use and has designed and installed electric plumbing and heating systems for it.

But spare time for Tallamy still is limited. There are professional activities to keep up with. He was on the executive committee of the American Association of State Highway Officials in 1948, first vice president in 1950, and its 39th president in 1951. In the American Society of Civil Engineers he is a member of the executive committee of the highway division, also chairman of a special task committee "to interest engineers in road problems in their specialized areas."

In addition, he belongs to the Society of American Military Engineers, National Society of Professional Engineers, American Bridge and Tunnel and Turnpike Association, New York State Association of Highway Engineers, American Road Builders Association and Albany Society of Engineers. And he's honorary vice president of the New York Association of Town Superintendents of Highways.

All of these professional interests are time consuming. But to a highway leader such as Tallamy finding a solution to the national road crisis is a continuing action and never final. As he puts it: "Highways have become absolutely indispensable to our very survival and they should be treated as one of our most important national assets. They should be protected and conserved in the same way that an individual would take care of his most valued possessions. They should keep pace with the progress they engender."

This Booklet shows...

...how Transite Sewer Pipe saves in **4** important ways

Selecting the right pipe material for a new sewage system—or for additions to an existing one—is a problem of major importance to *all* concerned in influencing a choice. *And* it can be solved to *the complete satisfaction of both installer and user* with economies in each of these stages—(1) system design (2) installation (3) operation and (4) maintenance.

Engineers thinking in long-range terms of thoroughly proved sewer main performance . . . contractors interested in serving community needs at new lows in installed cost—both should know all about Transite® Pipe and the Ring-Tite® Coupling. Here is a new booklet that tells and shows how Transite Pipe reduces infiltration, keeps out roots; maintains high flow capacity; speeds installation; permits designing the system for savings. Send the coupon for it today.

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WITH THE RING-TITE COUPLING

Johns-Manville, Box 60, New York 16, N. Y.

Gentlemen—Please send me your new Transite Sewer Pipe Brochure, TR-165-A.

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these jobs were done at a lower cost with the

SAUERMAN METHOD

Silt Removal by Slackline Cableway keeps channel clear for irrigation project. Bucket digs, then conveys spoil to downstream side of dam. (*Sauerman News 146*).

Digging Gravel for a plant supplying aggregate for 82 miles of turnpike, this 5-yd. DragScraper often operates around the clock. It has excavated over a million tons. (*Sauerman News 145*).

Reclaiming Material to hopper from all sections of a 500-ft. warehouse, the estimated operating cost of this DragScraper Machine is 2.1 cents per ton. (*Sauerman News 145*).

•

You'll find a complete description of the Sauerman Method in Catalog A, DragScrapers; Catalog C, Slackline Cableways; and Catalog E, Bulk Storage by Scraper.

SAUERMAN BROS., Inc. 632 S. 28th STREET BELLWOOD, ILLINOIS

Unit Prices

Alternate Bidding on Alabama Street Paving

This 16-mile street paving venture for Mobile, Alabama, is designed for four alternates on two sections and eight alternates on a third section. Palmer and Baker, Inc. of Mobile are consulting engineers.

The $1,448,346 contract is based on the alternates for asphaltic shell wearing surfaces on two sections and an asphaltic concrete wearing surface with asphaltic shell binder course on the other. All bids are based on the option for slag aggregate instead of gravel or stone.

Other alternates asked for a flexible base of shell with sand admixture with asphaltic shell, asphaltic concrete, or hot mix limestone asphalt wearing surface.

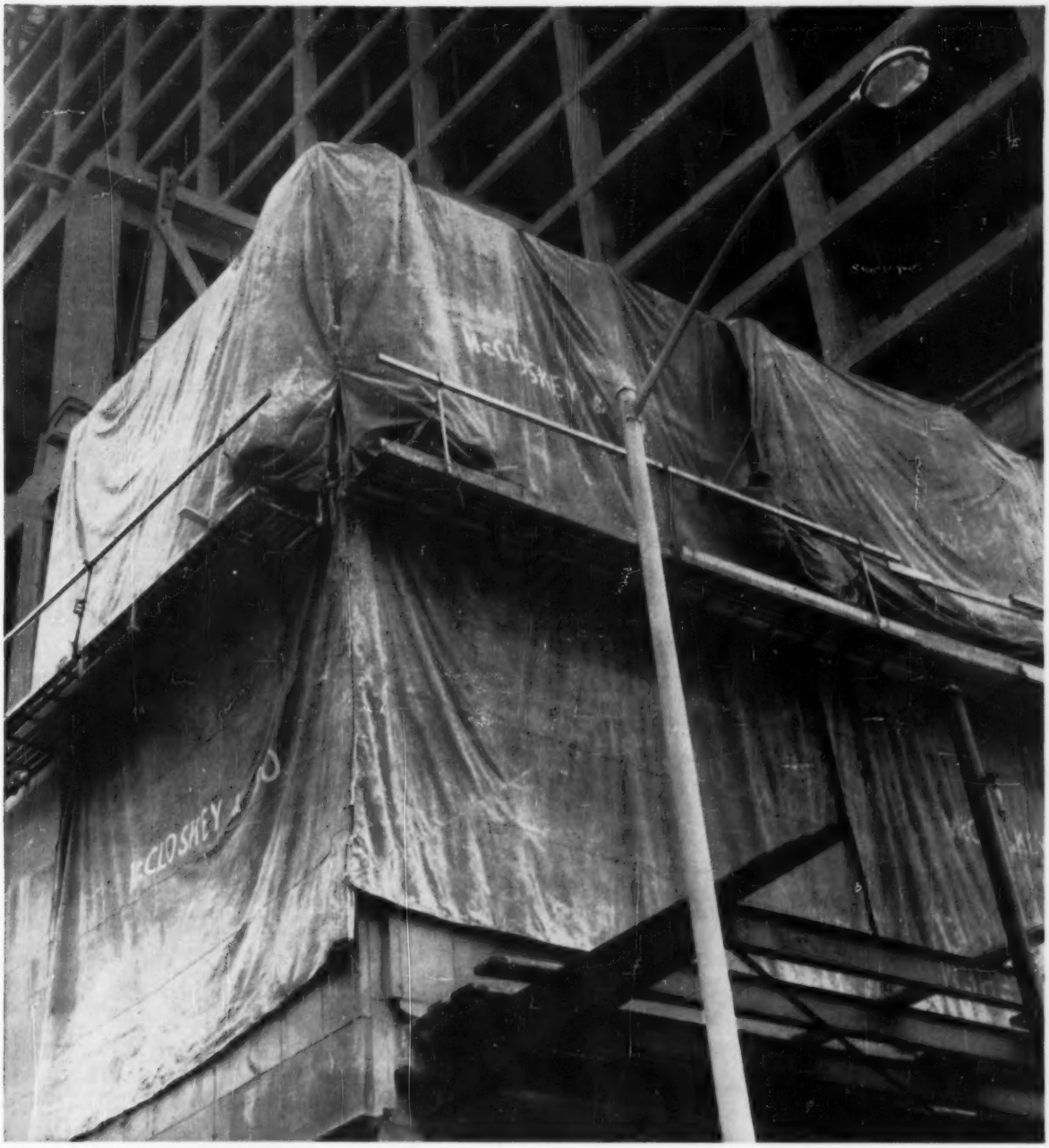
The successful bid, 3.04% below the second low bid and 12.5% below the engineer's estimate, came from T. L. James & Co., Inc., Ruston, La. They bid only on the alternates that appear in the table below.

Work under this contract includes a complete underground drainage with 59,000 lin ft of concrete culvert pipe and 1,360 cu yds of culvert concrete. The project requires relocating or replacing most of the existing underground utilities.

1C T. L. James & Co., Inc., Ruston, La $1,448,346
2 Farmer Const. Co., Inc., Findley, O 1,493,723
4 Moss-Thornton Co., Inc., Cohron Const. Co., Inc., Sou. Amiesite Asph. Co., Inc., Leeds, Ala 1,681,088
EE Palmer and Baker, Inc., Mobile, Ala 1,655,954

Bids: 4-17-56 Items	Unit	Quantity	Unit Prices 1C	2
Schedule I				
Clear & grub	a'	* 0	$500.00	$1,000
Tree, remov, 6-12"	ea	633	25.00	40.00
12-24"	ea	50	60.00	75.00
24-36"	ea	23	125.00	175.00
over 36"	ea	22	200.00	380.00
Excav, ditch	cy	2,490	1.00	1.00
struct, unclassif	cy	5,680	1.50	1.00
Conc pave, remov & sal	sy	280	1.50	3.50
Struct, remov	ls	job	5,000	37,140
Pave, exist, scarify	sy	1,650	0.50	0.10
Roadway, finish, 100 sta	ea	827	15.00	30.00
Conc for struct, culv	cy	1,357	60.00	65.00
headwall & misc	cy	36	85.00	80.00
pipe encasement	cy	28	30.00	25.00
Bridge, conc, incl reinf	ls	job	8,500	11,000
Curb & gutt, conc	lf	140,404	1.75	1.65
Reinf stl, culv	lb	207,600	0.13	0.14
headwall & misc	lb	4,620	0.15	0.20
Piles	lf	500	10.00	2.00
Guard post, timber	ea	33	7.50	15.00
Drain pipe, bell & spigot 10"	lf	718	1.90	2.00
RCP, culv, 0-4', std str, 12"	lf	501	3.65	3.35
15"	lf	14,912	4.15	3.90
4-6', 15"	lf	9,304	4.15	4.25
6-8', 15"	lf	1,110	4.40	4.85
8-10', 15"	lf	174	5.20	6.55
0-4', 18"	lf	3,471	4.65	4.75
4-6', 18"	lf	3,970	4.95	5.10
6-8', 18"	lf	394	5.20	5.80
0-4', 24"	lf	3,854	6.60	6.70
4-6', 24"	lf	6,448	6.90	6.90
6-8', 24"	lf	2,408	7.40	7.55
8-10', 24"	lf	155	7.95	8.65
0-4', 30"	lf	310	9.05	9.50
4-6', 30"	lf	2,480	9.55	9.80
6-8', 30"	lf	970	10.05	10.55
4-6', 36"	lf	1,466	12.30	12.50
RCP, culv, std str, 6-8', 36"	lf	1,254	12.85	13.10
4-6', 42"	lf	332	15.10	15.45
6-8', 42"	lf	1,190	15.80	16.10
8-10', 42"	lf	465	16.45	16.55
10-12', 42"	lf	518	17.00	17.50
12-14', 42"	lf	95	17.55	19.30
0-4', 48"	lf	63	20.50	19.15
10-12', 48"	lf	20	24.80	21.60
0-4', 60"	lf	25	28.35	27.90
4-6', 60"	lf	97	29.45	29.40
6-8', 60"	lf	141	30.50	31.00
8-10', 60"	lf	170	32.10	33.70
10-12', 60"	lf	77	34.25	35.50
12-14', 60"	lf	49	36.40	36.60
0-4', 56x36", arch	lf	199	20.75	22.25
4-6', 56x36", arch	lf	467	21.30	23.05
6-8', 56x36", arch	lf	265	22.40	25.00
Pipe, culv, remov & relay	lf	28	5.50	3.00
Manholes, brick, 4', 0-4'	ea	20	175.00	140.00
4-6'	ea	64	195.00	160.00
6-8'	ea	25	215.00	180.00
10-12'	ea	1	300.00	210.00
5', 4-6'	ea	4	215.00	200.00
6-8'	ea	5	240.00	220.00
8-10'	ea	3	270.00	250.00
10-12'	ea	4	350.00	280.00
6', 4-6'	ea	2	300.00	220.00
6-8'	ea	1	375.00	240.00
8-10'	ea	1	480.00	280.00
6.5', 4-6'	ea	1	450.00	250.00
6-8'	ea	1	480.00	275.00
Drop inlet, type 1, single	ea	311	160.00	130.00
double	ea	62	270.00	225.00
type 2, single	ea	83	185.00	165.00
double	ea	15	315.00	270.00
type 4	ea	1	215.00	130.00
type 5	ea	2	425.00	150.00
Junction box, brick	ea	69	150.00	100.00
Driveway exits, std	ea	1,114	25.00	25.00
Manholes, adjust to grade	ea	264	27.00	30.00
Water main valv box, adjust	ea	238	13.00	15.00
Subtotal			$960,882	$994,543
Schedule II				
Roadwy excav & embkmt	cy	36,700	0.60	0.70
Sprinkling	Mgal	500	2.00	4.00
Rolling, smooth wheel, tamp pneu tires	hr	400	7.60	8.00
Soil cement mix & shape	sy	116,700	0.35	0.40
Cmt for soil stabilization	bbl	13,150	3.50	3.65
Wear surf, asph shell, 1.5"	t	8,240	7.50	7.67
Alt: AC, type D, 1.5"	t	8,240	8.00	7.25
Tack coat	gal	17,500	0.14	0.16
Surf treat, singl, bit	sy	116,700	0.17	0.19
Totals			$196,779	$213,741
Alternate Totals			200,899	210,281
Schedule III				
Roadwy excav & embkmt	cy	22,900	0.60	0.70
Sprinkling	Mgal	370	2.00	4.00
Rolling (same as above)	hr	260	7.00	8.00
Soil cement mix & shape	sy	90,100	0.35	0.40
Cmt for soil stabilztn	bbl	10,200	3.50	3.65
Wear surf, asph shell, 2"	t	8,500	7.50	7.67
Alt: AC, type D, 2"	t	8,500	8.00	7.25
Tack coat	gal	13,600	0.14	0.16
Surf treat, single, bit	sy	90,100	0.17	0.19
Totals			$164,646	$177,510
Alternate Totals			168,896	173,940
Schedule IV				
Roadwy excav & embkmt	cy	6,200	0.60	0.70
Sprinkling	Mgal	60	2.00	4.00
Rolling (same as above)	hr	50	7.00	8.00
Soil cement mix & shape	sy	13,600	0.35	0.40
Cmt for soil stabilztn	bbl	1,600	3.50	3.65
Wear surf, AC, type F, 1"	t	650	8.25	7.25
Tack coat	gal	8,200	0.14	0.16
Bind crse, asph shell, 2"	t	1,300	7.50	7.67
Alt: AC, type D, 2"	t	1,300	8.00	7.25
Tack coat	gal	1,400	0.14	0.16
Totals			$30,811	$32,258
Alternate Totals			30,887	31,054
Schedule V				
VC san sewer laterals 0-4', 6"	lf	6,188	1.70	2.00
4-6', 6"	lf	6,090	1.95	2.25
6-8', 6"	lf	5,910	2.15	2.50
Excav, trench for sewer, 8" water line adj incl bkfl	cy	10,652	2.15	2.00
for inst or replac sewer & water main incl bkfl	cy	13,993	2.15	1.60
Totals			$87,228	$83,906

Time to complete: 300 working days
Liquidated damages: $250.00 per day



HIGH LEVEL EXPOSURE – Towering high above Philadelphia's busy Pennsylvania Railroad Station, this massive framework of iron and steel will eventually become a new 24-story, 1000-room Sheraton Hotel. In order to provide maximum protection during construction, McCloskey & Company, Builders, use these sturdy canvas tarpaulins – made of Mount Vernon duck and produced by the Webb Manufacturing Company.

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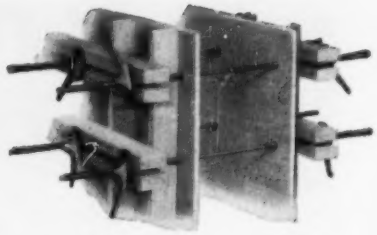
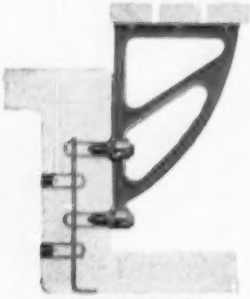


TILT LOCK CLAMPS

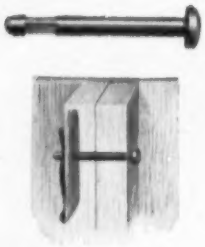
SNAP TIES

STANDARD COIL TIES

CONE-FAST COIL TIES



RISERFRAMES



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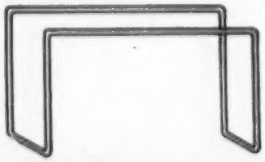

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Materials and Labor Prices Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- July 5 —Cement, Aggregate, Ready-mixed Concrete, Asphalt
- July 12—Iron and Steel Products, Pipe
- July 19—Wood Products, Glass, Explosives, Chemicals
- July 26—Clay Products, Lime, Plaster, Paint, Roofing

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED Per M. lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over,			BRICK Per M. in quantity		LIME Per ton, in paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$148.25p	$148.25p	$296.50p	$333.55p	.....	.....	$30.50p	$30.50p	$32.70	$23.80	$24.80
Baltimore	202.60	215.00	405.00	458.50	506.00	581.00	36.00k	41.00k	33.00	22.00	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	465.00p	27.00ff	38.00gg	33.35	22.30	26.33
Boston	210.00†	224.60†	459.00†	467.80†	.....	.....	40.00p	44.00p	35.70†	30.00†	.....
Chicago	138.00	145.00	280.00	.....	.....	.....	30.00	32.00	38.00	29.00	.....
Cincinnati	205.00j	225.00j	396.00jdd	213.00j	288.00j	314.00j	45.00j	46.00j	28.50j	24.25j	28.50j
Cleveland	195.00**	207.00**	.....	.....	.....	.....	40.00	42.00	29.75	24.75	.....
Dallas	.....	152.00	.....	.....	.....	.....	25.75	45.00	32.00	31.00	.....
Denver	.....	.....	.....	.....	.....	.....	36.00	41.00	34.00kk	28.00kk	34.00kk
Detroit	213.00	226.00	425.00	.....	620.00	710.00	41.00ee	40.50ee	34.00	30.00	.....
Kansas City	127.50	147.50	270.00	270.00	340.00	400.00	29.25	29.25	32.00	27.50	28.50
Los Angeles	r	r	r	r	r	r	30.00ij	.....	34.00	34.00	35.00
Minneapolis	185.00p	206.00p	422.00p	206.00pw	.....	.....	43.00*p	50.00	44.00hh	34.00hh	46.00hhh
Montreal	164.00aq	178.00au	325.00au	270.00	288.00	.....	42.00	49.00	39.20	22.00	19.75u
New Orleans	180.00	180.00	340.00	380.00	.....	.....	35.00	35.00	30.60	21.50	21.50
New York	188.10A	168.60A	231.70cA	255.20kn	.....	.....	44.00	.....	37.00	35.00	.....
Philadelphia	156.30	166.80	312.70	375.20	.....	.....	30/34	34/40	27.60	25.60	3.17
Pittsburgh	164.00	162.00	292.00	340.00	420.00	495.00	36.00	46.00y	32.00	29.50	2.97m
St. Louis	178.50ee	205.00ee	358.00ee	500.00ee	.....	621.50	43.00nl	41.50n	95eeaa	80eeaa	1.55aapee
San Francisco	186.65n*	177.10n*	235.30ddo*	.....	.....	.....	39.50*	39.50*	26.60	26.60	30.50
Seattle	225.00ee	250.00ee	350.00ee	250.00eew	.....	.....	43.00e	55.00e	46.00aAA	38.25AA	3.90mAA
Toronto	138.70	148.90	273.75	232.00f	.....	.....	41.50	63.00	40.00	33.50	31.00

*† F.o.b. yard Roxbury. *a Smooth. *b Per 50 lb. bags. *c 6 x 12 x 12 in.-3 cell. *d Pulverized hot. *e 8% 10th following month. *f 8 x 8 x 12. *g 8½ x 8 x 12. *h F.o.b. trucks, job site N.Y.C. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. *n 7⅝ x 7⅝ x 12. Speed tile. *p Truck lots. *q Provincial and Municipal tax extra. *r Not used because of earthquake danger. discount for cash. *t 8½ x 8 x 11¼. *u Tax exempt. *v Sand lime. *w 8 x 8 x 12. *y Stacked. *z Pebble lime price per 80 lb. sack. not sold per ton. *bb LCL. *cc Truck delivery. *dd 8 x 12 x 12. *ee Pebble lime. *ff 80% common. *gg Rough. $40.00 Smooth. *hh Ist. §F.o.b. yard *** Warehouse delivery. ** F.o.b. plant Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. casse In oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 65–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$19.25	$28.275	$3.50	$3.86	$3.31	$3.15	$2.95	$2.95	$0.63	$57.75
Baltimore	19.00	27.90	3.78	4.25	3.35	3.78	4.25	4.25	.48	60.18
Birmingham	19.25	28.275	3.90	3.40	....	3.00	2.55	2.55	.75ff	39.50ee
Boston	19.00	27.90	....	....	....	3.24gq	2.75aq	2.75aq	.48q	54.00q
Chicago	19.00	27.90	....	....	....	3.57‡s	2.953e	2.953e	.45 50‡hhv	52.70‡
Cincinnati	19.00	27.90†	....	....	....	3.00	2.55	2.55	.594y	49.36
Cleveland	19.00	27.90	2.50ppq	2.86qq	2.83qq	3.00q	2.55o	2.55o	.45q	45.00kk
Dallas	19.25	28.65	....	4.05	....	3.50q	3.75o	4.35o	.36	58.50kk
Denver	19.50	28.40	3.29	3.15	3.04	2.70	2.25o	2.25o	.45ff	45.00
Detroit	19.00	27.90	3.35	3.25	3.80	3.83	2.295f	2.295f	.53	47.30
Kansas City	19.00	28.65	3.64	3.12	2.76	3.48	3.32o	3.32o	.55	79.71
Los Angeles	19.00	28.15	3.30n	4.50n	4.20n	2.90m	2.05ee	i	.64qq	i
Minneapolis	19.00	29.88/28.02	....	....	....	3.70dd	2.295kkdd	2.295kkdd	.46kkdd	46.00r
Montreal	.....	21.65	5.02Dfi	5.94Efi	4.65Ffi	.....	.....	.....	.....	.....
New York	19.00	27.90	....	....	....	2.84G	2.36Go	2.36Go	.463Gs	46.00*
Philadelphia	19.00	27.90	3.60	3.40/3.65	3.60/4.60	2.54	2.94	2.94	.37	28.00
Pittsburgh	19.00	27.90	3.10	3.36	3.68	3.73	2.85o	2.85o	.42	58.75
St. Louis	19.00	27.90	....	....	....	2.58r	2.44A	2.44A	.55g	54.53
San Francisco	19.00	28.15	2.95	4.15	3.40	2.87	1.80**	....	.47	.....
Seattle	19.00	28.40	3.30mee	4.02mee	....	3.66mqee	3.10kmee	....	.81mee	45.00mee
Toronto	.....	.....	....	....	....	4.45	4.10	.....	1.70	88.00

*† Delivered. * Note: Red lead in oil 50¢ higher than white lead in oil. *a Red lead prices change frequently due to pig lead price changes. *b U. S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lb. *f Per 432 sq. ft. *g F.o.b. yard, Roxbury. *h Per roll, 65 lb. *i Net carload lot prices; Minneapolis and vicinity. *k Per cwt. *l Not used. *m 1% discount for cash. *n F.o.b. city. *o Per 50-lb. roll. *p 5-drum, 50 gal. ea. *q Per 90-lb. roll. *r F.o.b. factory, Chicago. *s Truckload. *t Federal tax included, add 5% mun. & prov. tax. *u Per 90-lb. square. *v Per ton. *w Price to large paint contractors is $1.28 less *x Mineral surfaced. *y 55-gallon container. *z Drums. *aa 15 lb., 324 sq ft roll. *bb Roofers coating and cement; Price per ton. *cc LCL, truck delivery. *dd 2% cash discount. *ee Asphalt pitch in 100 lb. package. *ff 5-gal. drums. *gg F.o.b. factory, *hh Incl. freight. *D Std. Black. *E Ready-mixed. *F Over 80% ferric oxide. ** Aver. wt. approx. 425 to 650 lbs. drums. *G fob factory points

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER†		VERMICULITE†			PERLITE		ALUMINUM SHEET^	STAINLESS STEEL SHEET*-TYPE 302g		COPPER WATER TUBING-TYPE L 2000 ft lots
	Neat per ton	Gauging per ton	Horo Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated	Plaster Aggregate	Concrete Aggregate Untreated	Flat, .102" th 36"x96" & 48"x144"	Corr reef .032" th 35"x12'	20 ga 48"x96-120"	26 ga 36"x120"	per ft‡ ¾"k	1½"e
			per bag of 4 cu ft					per lb‡	per sht‡	per cwtAA	per cwtmm		
Atlanta	$30.00	$36.00	$1.55s	$1.65s	$1.80sd	$1.65	.....	$0.425n	$9.55n	$57.76n	$65.76n	$19.51f	$28.47f
Baltimore	24.10	34.50	0.95	1.15	1.15	1.10	$1.45	0.391	0.427r	56.25	64.25	0.21	0.30
Birmingham	38.00	43.00	1.55	1.55	1.80f	1.55	1.55	0.455	9.82	56.43	66.18	0.1951	0.2745
Boston	22.00	29.00	1.15/1.20	1.18/1.23	1.30	.....	.....	0.48p	26.15op	55.88dd	61.65ddff	0.1951	0.2745
Chicago	26.80	26.80	1.55	1.60	1.60f	1.50	1.50	0.455o	9.775dp	57.55ee	65.55ee	0.1951	0.2745
Cincinnati	21.60*o	21.60*o	1.75	1.75	1.75	1.38	1.44	0.400	8.66	57.60	69.30ff	0.1881	0.2644
Cleveland	28.00	43.00	1.12	1.16	1.24f	1.45	1.45	0.418aa	8.66	58.41	66.41	19.87f	27.96f
Dallas	29.80	31.80	1.20	1.25	1.30f	1.21	1.32	0.379	0.430r	55.00	63.00	0.1449	0.2029
Denver	25.00	25.00	1.45	1.35	1.50	1.40	1.50	0.452	9.23	57.67gg	67.87gg	0.2214	0.3114
Detroit	25.00	25.00	1.27	1.35	1.37	1.49	1.53	0.455	9.235	57.70	65.70	16.405ee	23.50f
Kansas City	30.00	35.00	1.20	1.20	1.40	1.35	1.50	0.431	10.32	60.72ee	68.72ee	22.14f	31.14f
Los Angeles	26.20	27.20	1.25ii	1.20ii	1.25ii	.....	1.60	0.46	8.99	58.10	66.10	0.2214	0.3114
Minneapolis	32.00	32.00	1.50	1.60	1.80	1.25	1.35	0.462	8.65	56.45	64.20ff	0.1951	0.2745
Montreal	28.80	33.20	1.10	1.30	1.30	1.15e	1.15e	0.372	8.25	62.75	.....	0.26	0.320
New Orleans	35.00	45.00	1.50	1.20	1.25	1.25	1.25	0.403	0.395aabb	57.14	65.18	0.1997	0.2745
New York	24.00	30.00	1.25	1.20	1.30	1.30	.....	0.445fee	8.98f	58.48	66.48	19.51f	27.45f
Philadelphia	23.25	32.00	1.35	1.35	1.40	.....	.....	26.50fee	7.56f	53.23f	60.98f	18.57f	26.09f
Pittsburgh	27.50	31.00	1.30	1.30	1.32	.....	.....	0.42	9.10	56.81	62.63	0.2045	0.2872
St. Louis	31.00	40.00	1.30	1.55jj	1.50	1.60	1.45	0.468ia	9.23e	58.04kk	77.04kk	22.54fm	31.72fm
San Francisco	27.85	32.00	1.05	1.05	1.24	1.03	1.25	0.46	8.45cc	62.55e	70.55e	0.1951	0.2745
Seattle	38.00	41.00	1.45	1.25k	1.85f	1.40k	.....	0.403	7.860	60.50ee	68.00ee	0.1951	0.2745
Toronto	30.00	45.00	1.20	1.30	1.35	.....	.....	0.397	21.55	62.75	95.00	0.3280pp	0.4130pp

† truckiots, delivered * carload ‡ delivered *a fob city *b ½" O.D. *c ⅝" O.D. *d In 1M lb skids *e Previous prices were 5-10M lb bracket *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled; 2B finish *h 15M lb *i 3003 alloy; 1100 alloy: $0.456 lb *j 1100 & 3003 alloy, mill finish *k per bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob plant, fr allow *o 5M lb & up *p 100 sq ft quantity *q 2M lb quantity *r per lb *s 30¢ bag *t 26" x 96': 10.81 lb/sh; 48" x 144": 21.7 lb sh *u 19.31 lb/sh *v fob plant *w 48" x 144" *x 36" x 96" $13.25/sh *aa 10M lb & up *bb fob mill *cc 26" x 6-12' *dd add $0.75 cwt for boxing *ee 4 tons & up *ff 26 ga *gg add $2 cwt boxing; $0.75 cwt on skids *hh Theoretical wt for 48" x 96"; 50.4-lb, per sh. *ii 300-bag lots *jj per 100-lb bag *mm Theoretical wt: 19.7-lb per sh. *nn Deliv, warehouse means *oo ¼" O.D. *pp Incl 10% sales tax

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- July 5—Cement, Aggregate, Ready-mixed Concrete, Asphalt
- July 12—Iron and Steel Products, Pipe
- July 19—Wood Products, Glass, Explosives, Chemicals
- July 26—Clay Products, Lime, Plaster, Paint, Roofing

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft ½"	⅝"	GYPSUM BOARD LATH plain or perf per Msq ft ⅜" x 16" x 48"	½"	GYPSUM SHEATHING tongue & groove per Msq ft ½" x 2' x 8'	FIBER BOARD SHEATHING asph impreg & coat per Msq ft ½" sq ed	½" T&G	FIBER BOARD INSULATION sq edge, paint per Msq ft ½"	MINERAL WOOL INSULATION† loose, per 40-lb bag a	3" batts per M sf	GLASS FIBER INSULATION† loose, per 40-lb bag a	3" batts per M sf	ALUMINUM FOIL #60 Kraft Expansible 1 side foil per roll of 250 s.f.	Blanket 2 layers foil per Msq. ft
Atlanta	$70.00	$80.00	$43.00		$70.00	$75.00	$127.00	$77.00	$1.08	$75.00	$1.45b	$85.00	....	....
Baltimore	51.25/	44.75/	32.50/		55.00/	65.00/	108.50/	60.00/	1.30	66.50	1.60	48.00	$4.00g	$33.50
Birmingham	79.00	65.00	51.11		82.00	80.00	134.00	70.00	1.40	70.00	1.60	75.00	2.99g	....
Boston	56.00m	46.50m	33.00m		52.00m	64.00m	109.00m	79.00kn	1.45	75.00	....	52/56	6.00	55.50
Chicago	65.00	52.00	43.00		60.00	80.00	130.00	60.00	1.55	80.00	....	63/65bb	5.25r	....
Cincinnati	46.40w	41.60w	30.80w		49.81w	67.50w	120.00w	70.00w	1.25	60.00	1.25	73.50	2.84	50.00w
Cleveland	50.50	55.00	40.00		65.00	70.00	111.00	70.00	1.35/1.50	70.00	1.60**	60.00**	17.50*	50/55
Dallas	58.00	55.00	42.50		65.00	75.50	122.50	70.00	1.90	68.00	1.35	65.83	4.25	....
Denver	62.00	54.50	41.00		62.00	75.90	126.00	74.90	....	71.00s	1.20v	55.00	11.00r	21.00
Detroit	53.00	48.00	36.00		57.50	68.50	98.00	57.50	....	....	1.95b	83.00	....	....
Kansas City	65.00	55.00	40.00		65.00	72.00	120.00	75.00	1.40	80.00	1.40	80.00	11.24dt	19.44
Los Angeles	60.00	52.50	0.326z		60.00	71.87	121.25	80.00	....	83.00	1.38a	64.00	4.26y	....
Minneapolis	80.00	70.00	0.40z		80.00	70.00	140.00	78.00	1.60	80.00	1.80	80.00	6.50	....
Montreal	56.00	48.00	36/39		53.00	60.00	.....	62.00	1.10	60.00	1.10	60.00	20.00o	80.00
New Orleans	55.00	48.00	45.00		70.00	75.00	125.00	72.50	1.75	68.00**	....	....	....	....
New York	52.00	45.50	35.00		53.00	69.00	109.00	70.50	1.55	65.00	1.90p	67.00	5.20	48.80cc
Philadelphia	50.00	48.00	34.00		48.50	67.50	105.00	49.20	....	63/70	....	70/75	5.50/6.34	50/44.50
Pittsburgh	55.00	55.00	40.00		68.00	65.00	105.00	60.00	1.90	72.00	1.90	72.00	4.10	....
St. Louis	65.00	55.00	40.00		65.00	77.00	115.00	77.50	1.60	80.00	1.65	82.00	4.75d	....
San Francisco	52.00c	44.75	0.34z		56.00	59.00	99.00	58.00	1.60	68.50	1.55	66.50	4.82	53.50
Seattle	53.50	57.50	46.50		63.50	72.50	122.00	71.50	1.75y	79.00	1.60nnz	54.00nn	4.25g	46.50
Toronto	51.00	50.00	40.00		64.50	75.00	.....	.....	0.90	51.00	....	51.00	16.10u	43.65

*a for hand packing *b per 30¢ bag *c carloads *d 40¢ kraft paper *e 20¢ sq ft bag, 4" thick *f full trailer loads *g 80¢ kraft paper backing *h LCL *i flameproof $75.00 *m 10 ton quantities *n distributor's siding *o per Msf roll *p per sf *r per cwt *s per 35¢ bag *t per M sq ft *w fob city *x per sq. yd. *y 26¢ bag *z 32¢ bag *aa fob warehouse *bb 2" *cc in 250 sf rolls, of 16", 20", or 24" width.

HOURLY WAGE RATES—Base rate + fringe benefits

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const
Atlanta	$3.25	$2.70	$2.95	$2.70	$2.875	$3.00	$3.05+10¢f	$1.40	$1.40
Baltimore	3.45+10¢g	2.95+7½¢	3.50+7½¢	2.70/2.95+10¢d	3.25+7½¢i	3.50	3.20+7½¢i	1.60+7½¢i	1.60+7½¢i
Birmingham	3.50	2.60	3.00+7½¢h	2.42	2.92f	3.175	3.05+7½¢h	1.50	1.60
Boston	3.50+10¢d	3.05+10¢d	3.40+7½¢h	3.40	3.25+20¢f	3.20+12¢h	3.20+10¢d	2.30+7¢f	2.30+7¢f
Chicago	3.62½+7½¢h	3.35+10¢e	3.55+7½¢h	3.25+5¢m	3.54+23¢e	3.48+21¢f	3.37+22¢m‡	2.57½+7½¢h	2.57½+7½¢h
Cincinnati	3.60	3.275	3.20+7½¢h	3.075/3.325	3.225	3.50+3¢N	3.50+9½¢f	2.35	2.25
Cleveland	3.55+10*	3.575	3.50+7½¢h	3.475	3.475	3.425	3.375+10¢d	2.825	2.75
Dallas	3.625	2.875	2.95	2.875+7½¢h	3.437	3.00	3.105+8¢bb	1.50	1.50
Denver	3.50	2.975	3.00+7½¢i	2.93	3.30+7½¢i	3.00	3.05+15¢ii	2.00	2.00
Detroit	3.53+20¢ee	3.20+20¢e	3.325+15¢ff	3.30+15¢ee	3.51+24¢ei	3.50+30½¢ff	3.295+22½¢h	2.50+15¢ee	2.55+10¢e
Kansas City	3.70	2.90	3.075	3.095	3.375	3.20+13¢ff	3.15+7½¢h	2.155	2.18
Los Angeles	3.80	3.50+10¢e	3.25+7½¢h	2.81+10¢e	3.625+12½¢ff	3.45	3.425+10¢e	2.30+7½¢h	2.30+7½¢h
Minneapolis	3.425	3.00	3.17	2.95	3.05+23¢ee	3.12m	3.00+20¢e	2.25	2.25
New Orleans	3.25	2.675	2.90+7½¢h	2.80+7½¢h	2.90+5¢m	3.025+7½¢h	3.00+10¢e	1.55	1.55
New York	4.05+36¢ii	3.65+27½¢ii	3.95+34¢ii	3.90+31½¢ii	4.00+50¢ff	3.50+38¢ff	3.85+35¢ff	2.60+21¢ff	2.60+21¢ff
Philadelphia	3.75+17¢i	3.385	3.55+18¢i	3.15½/3.90½+10¢i	3.65+15¢ff	3.77+15¢ee	3.75+11½¢e	2.10	2.40
Pittsburgh	3.60+17½¢h	3.325+7½¢h	3.30+7½¢h	3.35+7½¢h	3.40+17½¢h	3.50	3.45+7½¢h	2.10+7½¢h	1.98+10¢e
St. Louis	3.75+19¢e	3.25+7½¢h	3.25+7½¢h	3.325	3.425+7½¢h	3.50+25¢e	3.45+21¢ff	2.30+7½¢h	2.30+7½¢h
San Francisco	3.75+12½¢e	3.06+10¢e	3.25+10¢e	2.86+10¢e	3.56+10*	3.22½+20¢f	3.20+36¢ff	2.325+10¢e	2.325+10¢e
Seattle	3.40+10¢d	2.80+10¢d	3.07+10¢d	2.90+10¢d	3.15+10¢d	3.16+13½¢ff	3.10+21¢ff	2.37+10¢e	2.37+10¢e
Montreal	2.10+14¢t	1.90+14¢t	2.00+14¢t	1.80+14¢t	2.12+18¢t	2.10+18¢t	2.12+18¢t	1.30+10¢t	1.30+10¢t
Toronto	2.46+10¢**	2.40+10¢**	2.40+10¢**	2.50+10¢**	2.45+16¢**	2.65+10¢**	2.44+10¢**	1.45+6¢**	1.45+6¢**

ENR Skilled Average (Bricklayers, Carpenters, Iron workers): **$3.384. ENR Common Average $2.184**

* Cost of living bonus now included in basic wage. † 8% fringe benefits. ** 4% vacation fund. *a 6 hr. day. *b 7 hr. day. *c 3% vac. stamp fund plus 7½¢ WF for bricklayers; 4% VF for electricians plus 8¢ WF, 1% PF. *d 10¢ H&WF. *e 10¢ VF. *f 6% WF. *g 11½¢ WF. *h $2.85 hones & housing plus 7½¢ WF. *i 17¢ WF. *j 10½¢ hr. WF. *k 7½¢ hr. WF. *14% VF. *m 5¢ hr. WF. *n Plus 10% fringe benefits on gross wage ea. yr. *o 10¢ PF. *p 3% WF, 3% PF. *q 10¢ ins; 6% vac. and holiday pay. *r 4% WF and 20¢ PF. *s 5% W&PF, 4% VF, 1% NC, 6 PH. *t 7½¢ H&WF. *u 1½% PF. *v 10¢ WF. *w Negotiating. *x 5¢ VP. *y 23¢ WF. *A 15¢ WF, 15¢ PF, 20¢ B.F. *C 15¢ WF *D 10¢ H&WF, 5¢ organ. *E 6% WF, plus travel pay per day. *F Plus $4 per day Anniversary contrib. *G 3¢ Prom. *H 7¢ WF, 6% VF. *I 15¢ H&WF, 5¢ for Advtg. *J 5% WF, 6 PH. *K 11¢ WF, 12½¢ VF, 10¢ PF. *L 3% WF, 3% PF, 2% VF. *M 7½¢ PF. *N 1% WF. *O 10¢ WF, 1% PF. *P 10¢ hosp. ins.; 5¢ vac. *Q 1 drum, 2 drums 3.40/3.55+10¢*R 12¢ WF and 1¢ apprentice *S 12½¢ H and WF. *T 21¢ H, W & VF. *U 7½¢ WF, 4% VF. *V 8% WF, 3% PF. *W 2% F. *X 8¢ VF, & 7½¢ H & WF. *Y 7¢ H & WF. *Z 9½¢ WF. *aa 7¢ WF, 15¢ PF. *bb 8¢ WF. ‡ eff. 7/1/56.

	Truck drivers 1½ T	Truck drivers 4 cy	Truck drivers +4 cy	Tractor Operators incl. bulldozers 34-49 hp	Tractor Operators incl. bulldozers 70-100 hp	Tractor Operators incl. bulldozers 100 & over	Tractor scraper 15-18 cy	Power cranes & shovels ½ cy	Power cranes & shovels ¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$1.50	$	$	$2.425	$2.425	$2.425	$2.425	$2.95	$2.95	$2.425	$2.20	$1.60
Baltimore	1.60+7½¢e	1.75+7½¢e	1.85+7½¢e	2.85/3.00b	2.85/3.00b	2.85/3.00b	2.85/3.00b	3.40/3.55+10¢m	3.40/3.55+10¢m	2.85/3.00b	2.85/3.00b	2.25
Birmingham	1.60	1.89ff	2.05ee	2.56	2.56	2.56	2.70	2.70	2.70	2.61	2.285	1.65
Boston	2.10e	.....	.....	3.025d	3.025d	3.025d	3.025d	3.40	3.40	3.40	2.95	2.22e
Chicago	2.08+12½¢ee	.....	.....	3.00+5¢e	3.15+5¢e	3.05+5¢e	2.85+5¢e	3.60+5¢e	3.60+5¢e	2.95+5¢e	2.95+5¢e	.....
Cincinnati	2.20ee	2.30ee	2.40ee	3.075	3.075	3.075	3.075	3.325	3.325	3.325	3.325	3.325
Cleveland	2.50	2.50	2.50	3.225	3.225	3.225	3.225	3.475	3.475	3.225h	3.10	3.10
Dallas	1.50	1.50	1.50	1.50/2.625f	1.50/2.625f	1.50/2.625f	1.50/2.625f	1.50/2.625f	1.50/2.625f	1.50/2.625f	1.50/2.00f	1.50/2.00f
Denver	2.15	2.15	2.25	2.15	2.76	2.76	2.76	2.93	2.93	2.76	2.76	2.35
Detroit	2.45	2.45	2.45	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.025+10¢m	2.68+20¢mm
Kansas City	2.115n	2.115n	2.10n	2.90	2.85n	2.85n	2.85n	3.095	3.095	2.71	2.85j	2.24
Los Angeles	2.405+7½¢e	2.405+7½¢e	2.435+7½¢e	2.90+10¢m	2.90+10¢m	2.90+10¢m	3.24+10¢m	3.05+10¢m	3.05+10¢m	3.05+10¢m	2.49+10¢m	2.51+7½¢e
Minneapolis	2.25	2.25o	2.40o	2.63	2.85o	3.07o	2.85	3.07o	3.33o	2.63	2.52	2.35
New Orleans	1.675	1.675	1.675	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.15	1.575
New York	2.12½+13¢ee	2.75+14¢kk	2.75+14¢kk	3.27½+262¢mmf	3.27½+262¢mmf	3.27½+262¢mmf	3.40+272¢mmf	4.15+332¢mmf	4.15+332¢mmf	3.40+272¢mmf	3.40+272¢mmf	3.00+15¢mmf
Philadelphia	—— 1.925/2.15+7½¢m		——	—— 3.15½/3.90½+10¢m	——	3.15½/3.90½+10¢m	—— 3.15½/3.90½+10¢m	—— 3.15½/3.90½+10¢m	——	3.15½/3.90½+10¢m	2.97½+10¢m	2.13½+10¢m
Pittsburgh	2.20+7½¢e	2.30+7½¢e	2.30+7½¢e	2.87½+7½¢e	3.20+7½¢e	3.27½+7½¢e	3.25+7½¢e	3.35+7½¢e	3.35+7½¢e	3.25+7½¢e	3.35+7½¢e	2.20+7½¢e
St. Louis	2.30+7½¢mm	——	——	3.325hh	3.325hh	3.325hh	3.325hh	3.325hh	3.325hh	3.325hh	2.775hh	2.775hh
San Francisco	2.32½+10¢e	2.32½+10¢e	2.465+10¢	3.095f+10¢m	3.095f+10¢m	3.095f+10¢m	3.095f+10¢m	3.425f+10¢m	3.425f+10¢m	3.255f+10¢m	2.705f+10¢m	2.30+10¢m
Seattle	2.63+7½¢mm	2.63+7½¢mdd	2.83+7½¢mm	2.78+10¢m	2.95+10¢m	2.95+10¢m	2.95+10¢m	3.36+10¢m	3.36+10¢m	3.10+10¢m	2.78+10¢m	2.52+10¢m
Montreal	1.30+10¢ll	1.30+10¢ll	1.30+10¢ll	1.73+14¢ll	1.73+14¢ll	1.73+14¢ll	1.73+14¢ll	1.99+16¢ll	1.99+16¢ll	1.73+14¢ll	1.50+15¢ll	1.50+15¢ll
Toronto	1.47+6¢ii	1.45+6¢ii	1.65+7¢ii	1.90+8¢ii	2.00+10¢ii	2.00+10¢ii	1.90+8¢ii	2.30+16¢ii	2.30+16¢ii	——	2.05+8¢ii	2.05+8¢ii

*a 5¢/hr HWF *b lower rates, straight time, other broken *c 2-axle; 10-wheel $2.15; Euclid $2.45 *d Intermediate *e bldg constr; highway $2.145 *f less than 2-t *g blade *h scoop, bldg *i scoop, road *j plus $2 pd by employer for hosp. death benefits to family *k bldg constr; steel constr $3.475 *l higher rates are union, other taken from min wage scale approved by County Commissioners Court *m 10¢ H&WF *n flatbed *o under 10 cy *p over 10 cy *q over 80 hp *r blade grader *s form and subgrade *t single *u 7½¢ HWF *v up to 6 cy *w 6-8 cy *x cat oper *y up to 3½ cy *z 3½ cy & over *aa plus approx $5.30 per wk W&PF *bb 3% WF, 2% PF, 11 PH *cc 4% WF & 4% PF *dd up to 5 cy *ee 5 cy & over *ff over 1½ T but not over 3 *gg up to 5 tons *hh excavating *ii 4% VP *jj 12¢ H, W & PF *kk 7½¢ WF included in base pay *ll 8% fringe benefits *mm 10¢ H & WF, 10¢ insurance *nn 8 cy or less; 8-16 cy $2.90; 16-26 cy $3.15 *oo Plus $2.28/wk WF *pp 2-5 T $1.70 *rr 12¢ WF *ss 5% WF. ‡ eff. 7/1/56.

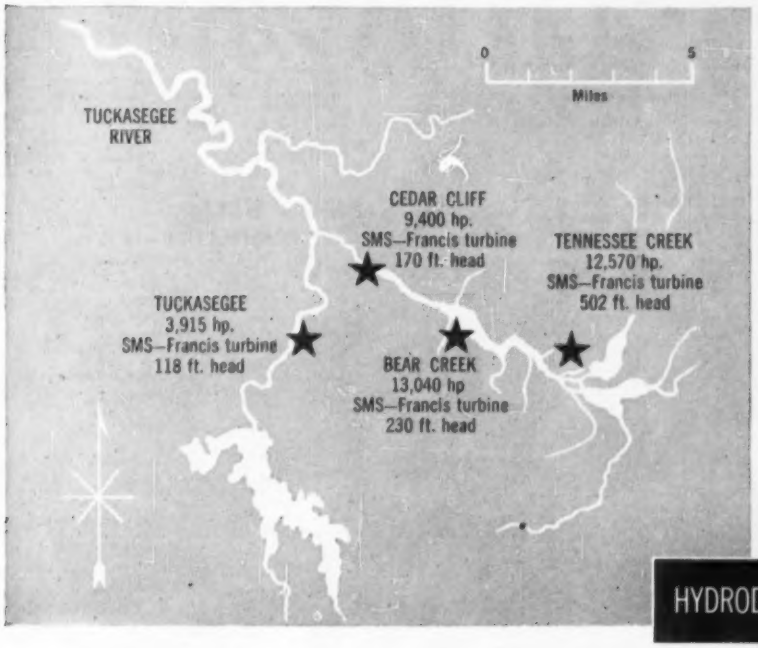
MEXICO CITY PRICES

In Pesos, f.o.b. City		Apr. '56	May '56
Common Wages—Building (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Common Wages—Heavy Const. (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Skilled Labor Wages			
Carpenters (8 hr. day) 1 cl.	av. per hr.	2.46	2.46
Bricklayers (8 hr. day) 1 cl.	av. per hr.	2.46	2.46
Struct. Iron Workers (8 hr. day)			
Remachadores	av. per hr.	3.77	3.77

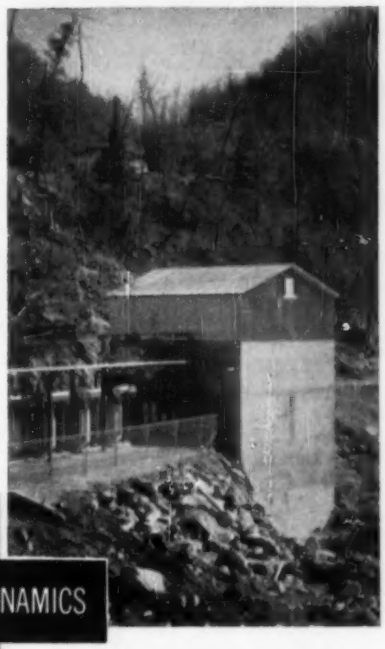
		Apr. '56	May '56
Struct. Steel, Shapes			
3"-15" x 12 meters	per metric ton	1564.34‡	1564.34‡
‡ fob Monterrey			
Reinf. Steel, Corr. Rods			
⅜" x 11 meters	per ton	1865.00	1865.00
½" x 11 meters	per ton	1865.00	1865.00
⅝" x 11 meters	per ton	1865.00	1865.00
¾" x 11 meters	per ton	1865.00	1865.00
⅞" x 11 meters	per ton	1865.00	1865.00
1" x 11 meters	per ton	1865.00	1865.00

		Apr. '56	May '56
Gravel truck load of 3½ cu. meters			
Blue Gravel	per tr. load	70.00	70.00
Rose Gravel	per tr. load	65.00	65.00
Cement, Std. Port. (Tolteca)	per ton	230.00	230.00
Lumber			
3rd Class Pine	per M ft.	1900.00	1900.00
1st Class Pine	per M ft.	2750.00	2750.00
2nd Class Pine	per M ft.	2300.00	2300.00

HOW ALCOA GOT LOW-COST POWER
DEVELOPING MARGINAL SITES



Between 1949 and 1952, Alcoa developed extra hydropower at low cost from these small sites on the headwaters of the Little Tennessee River.



Cedar Cliff is typical of the small, unattended stations in this development.

To get additional hydropower at minimum costs, Alcoa and its subsidiary, Nantahala Power & Light Company, have reached into the headwaters of the Little Tennessee River. As shown on the sketch map, four small sites on the east and west forks of the Tuckasegee River and Tennessee Creek now permit far greater utilization of the available water. But to make such installations pay, construction, operating and maintenance expenses were carefully planned and closely controlled.

Each of the new facilities is remotely operated from an existing station. Rock fill dams and unlined tunnels helped keep costs down, while powerhouses were built just large enough for the unit. On the SMS turbines themselves, vulnerable parts were given protective coatings of stainless steel to reduce maintenance over the years.

SMS turbines at these four stations have a total rated output of approximately 39,000 hp. All four of these are SMS-Francis types, while at Queens Creek Station a 2,250 hp. SMS-Impulse turbine operates under a 999-foot maximum gross head. SMS butterfly and relief valves supplied with the Tennessee Creek installation.

Whatever your needs for hydraulic turbines and accessories, contact S. Morgan Smith Company at York, Pennsylvania.

HYDRAULIC TURBINES
PUMPS
GATES & HOISTS
TRASH RAKES
ACCESSORIES

HYDRODYNAMICS

ROTOVALVES
BALL VALVES
BUTTERFLY VALVES
FREE-DISCHARGE VALVES
CONTROLLABLE PITCH SHIP PROPELLERS

S. MORGAN SMITH

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ **Mass., Baldwinville**—SCHOOL—BA 7/5—Towns of Templeton and Baldwinville, c/o supt. schools, Templeton High School, Baldwinville. $1,000,000. Plans deposit $100. L. W. Briggs Assoc., Inc., 90 Park Ave., Worcester, archt. CD 1/5/55.

HEAVY CONSTRUCTION—LB & CA

▲ **M. J. Walsh & Sons, Inc.**, 14 Shawmut Ave., Holyoke, Mass. LB $1,831,664. est. $1,800,000. U-603 No. 1, women's PHYSICAL EDUCATION bldg., University of Mass., AMHERST, MASS. State, University of Mass., c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids June 15. CD 5/22.

L. & R. Constr. of Medford, Inc., 36 Earl Ave., Medford, Mass. LB $960,102. est. $965,000. Ayers SCHOOL, Sylvan St., MALDEN, MASS. City, Mayor Fred I. Lamson, chm. bldg. comn., City Hall, Malden, Mass. Bids June 15. CD 6/4.

John Bowen Co., Inc., 173 Boston St., Dorchester, Mass. LB $952,633. est. $955,000. Brook Water Elementary SCHOOL, Water St., Saxonville area, FRAMINGHAM, MASS. Town, School Bldg. Comn., Union Ave., Framingham, Mass. Bids June 14. CD 6/1.

Donatelli Building Co. Inc., 118 Cottage St., Providence, R. I., LB $424,148. Woodridge SCHOOL addn. and alterations, 401 Budlong Rd., CRANSTON, R. I. City, School Comn., Park Ave., Cranston, R. I. Bids June 13. CD 5/25.

BUILDINGS—BA

▲ **E & F Const. Co.**, 94 Wells St., Bridgeport, Conn. CA $2,500,000. 4 story DORMITORY, gymnasium, and 2 story classroom-library bldg., brick with limestone trim, FAIRFIELD, CONN. Fairfield University, N. Benson Rd., Fairfield, Conn. J. Gerald Phelan, 211 State St., Bridgeport, archt. Awarded June 14.

MIDDLE ATLANTIC

▲ **N. Y., Fort Wadsworth**—HOUSING—BA On Or About 7/31—U. S. Eng., 111 E. 16 St., New York, Zone 3, construct and finance Capehart Housing, $1,000,000-$3,000,000, Samuel Paul, 89-51 164 St., Jamaica, archt.

▲ **New York**—HOUSING—BA 8/16—U. S. Eng., 111 E. 16 St., New York, Zone 3, construct and finance Capehart Housing Proj., in Niagara Area, $1,000,000-$3,000,000; Capehart Housing Proj. AAA facilities, New York Area, $1,000,000-$3,000,000, Turano-Gardner, 65 E. 55 St., New York, Zone 22, archts. CD 4/17.

▲ **N. Y., Fort Jay**—HOUSING—BA 8/16—U. S. Eng., 111 E. 16 St., New York, Zone 3, construct and finance Capehart Housing, $1,000,000-$3,000,000. Kelly & Gruzen, 80 Fifth Ave., New York, Zone 10, archts. CD 5/23.

HEAVY CONSTRUCTION—LB & CA

▲ **C. J. Langenfelder & Son, Inc.**, 8427 Pulaski Hy., Baltimore, Md. LB $4,015,305. P.T. 129, part of North approach expressway approx. 4.2 mi. incl. 6 bridges, Baltimore, part of Patapsco Tunnel Proj., MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. Bids June 14. CD 5/22.

Allied Contractors, Inc., 204 E. Preston St., Baltimore 2, Md. LB $990,468. Sec. 2-G, grading, drainage, structures, Jones Falls Expressway, BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. Bids June 13. CD 6/1.

BUILDINGS—LB & CA

▲ **Wilaks Constr. Co., Inc.**, 11 E. 44 St., New York 17, N. Y. CA Est. $1,500,000. 7 story student RESIDENCE HALL, Albert Einstein College of Medicine, Eastchester Rd. and Morris Park Ave., NEW YORK, N. Y. Yeshiva University, 270 Park Ave., New York 17, N. Y. Architects Associated, 551 Fifth Ave., New York 17, N. Y., archts. CD 6/27/51.

▲ **Larkfield Homes**, c/o Henry A. Klar Realty Co., 220-02 Horace Harding Blvd., Bayside Hills, N. Y. Owner Builds. $1,400,000. 90 HOUSES on tract on Larkfield Rd. north of Jericho Turnpike, EAST NORTHPORT, N. Y.

▲ **Wedgewood Park Homes**, c/o Stanley H. Klein, archt., 89-31 161 St., Jamaica, N. Y. Owner Builds. $8,500,000. 345 HOUSES, on tract on Waukena Ave. at Park Ave., OCEANSIDE, N. Y.

▲ **H. R. H. Constr. Co.**, 16 W. 46 St., New York 19, N. Y. CA Est. $30,000,000. co-operative HOUSING Proj. for 3,000 units on 153 acre tract at Cross Bay Blvd. and Belt Parkway to be called Lindenwood, OZONE PARK, N. Y. Lipkin-Kahn Co., c/o contractor. Samuel Paul, 89-51 164 St., Jamaica 3, N. Y. and Benjamin Braunstein, 163-18 Jamaica Ave., Jamaica, N. Y., archts.

▲ **Glendola Constr. Co.**, 1409 Webb Ave., Asbury Park, N. J. Own Forces. $3,500,000. HOUSING, adjoining Wanamassa Golf Club, ASBURY PARK, N. J. Wm. G. Chirgotis, 968 Stuyvesant Ave. Union, N. J., archt.

▲ **Terminal Constr. Corp.**, State Hy. No. 17, Wood-Ridge, N. J. CA Est. $15,000,000. Penn Terrace APARTMENT, for 900 units, three 20 story bldgs., on North Side of Pennsylvania Ave. between 24 and 25 Sts., PHILA., PA. Ricar Corp., c/o Max E. Cohen, Market St. National Bank Bldg., Phila., Pa. Samuel I. Oshiver & Assoc., 1913 Walnut St., Phila., Pa., archts.

SOUTH

BUILDINGS—BA

▲ **Ky., Fort Knox**—HOUSING—BA 7/26—U. S. Eng., 830 W. Broadway, Louisville, construct and finance, 2,049 housing units (Capehart), ENG-15-029-56-86, $26,000,000. CD 1/18, under Public Buildings.

HEAVY CONSTRUCTION—LB & CA

▲ **WEST VIRGINIA**—State Rd. Comn., Charleston,
Nello L. Teer Co., Trust Bldg., Durham, N. C., CA $1,980,890, grading, draining 1.904 mi. Patrick Street Bridge-C. & O. Depot Rd., Charleston, Kanawha Co. Bids May 22, awarded June 14. CD 5/25, under LB.

▲ **Bradfield Builders, Inc.**, 1101 Lincoln Rd. Bldg., Miami Beach, Fla. LB $4,021,151, combined bid. Part 1 and 2, National Airlines OFFICE and nose hangar bldg.; LB $1,366,600. Part 1, National Air Lines OFFICE, Miami International Airport, MIAMI, FLA. Comrs., Dade Co., Court House, Miami, Fla. Bids June 12. CD 5/21;
Fred Howland, Inc., 1451 N. W. 20 St., Miami, Fla. LB $2,054,000. Part 2, nose hangar. (Miami, Fla.).

BUILDINGS—LB & CA

▲† **Blake Constr. Co.**, 33 E. St., S. W., Wash., D. C. LB $922,000 Item 1; LB $848,000 Item 2, post maintenance SHOPS bldg., structural, steel, rein.-conc. bldg., portions of which are 1 story and 2 story electrical work, bit. paving, etc., Marine Corps School, NBy 2662. QUANTICO, VA. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids June 13. CD 5/4.

▲ **Arnold Constr. Co.**, Murray Bldg., Palm Beach, Fla. LB $6,249,377. teaching HOSPITAL, J. Hillis Miller Health Center, University of Florida, GAINESVILLE, FLA. State Bd. Control, Tallahassee, Fla. Bids June 4. CD 4/12.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.

▲ **Robert L. Turchin, Inc.**, 1835 Purdy Ave., Miami Beach, Fla. CA Approx. $1,500,000. The Florida Shores HOTEL, 9441 Collins Ave., SURFSIDE, FLA. Florida Hotel Corp., c/o M. Tony Sherman, archt., 625 N. E. 78 St., Miami, Fla. Bids May 8, awarded June 12. CD 6/12, under LB.

▲ **Southern Builders**, P.O. Box 1815, Shreveport, La. CA $1,783,000. CITY HALL and jail, SHREVEPORT, LA. City, City Hall, Shreveport, La. Bids May 31, awarded June 11. CD 6/12, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲ **ILLINOIS**—State Div. Hys., Springfield,
Allied Structural Steel Co., 20 N. Wacker Dr., Chicago, Ill., CA $1,084,515, steel for 13 span bridge over Illinois River, LaSalle Co. Bids Apr. 24. CD 4/27, under LB.

ILLINOIS—State Div. Hys., Centennial Bldg., Springfield,
Stupp Bros. Bridge & Iron, 3800 Weber Rd., St. Louis, Mo. CA $542,195, furnish steel for grade separations, SBI Rte. 13 and FA 14, 1 mi. southwest Belleville, St. Clair Co. Bids May 29, awarded June 8. CD 6/4, under LB.

▲ **Overland Constr. Co.**, 205 W. Wacker Dr., Chicago, Ill., LB $3,267,654, structural steel and machinery for Northwest Hy. Job, bascule bridge E. Ohio St. over rr/w and North Branch Chicago River, CHICAGO, ILL. Cook Co., County Bldg., Chicago, Ill. Bids June 5;
M. J. Boyle & Co., 2480 Elston Ave., Chicago, Ill. LB $968,395, substructure (Chicago, Ill.) LB $709,946, concrete pavement and quarters (Chicago, Ill.).

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Mich.—**Johnson-Greene Co.**—416 E. Huron St., Ann Arbor, Mich. LB $993,470. grading drainage structures aggregate base, bit. con. 14.35 mi. on US-131 from Hinman St. in Mancelona northeasterly to M-32, Antrim Co.;
Mich.—**Hodgkiss & Douma**, Petoskey, Mich. LB $310,657. aggregate base, grading 10.31 mi. on M-88 and M-66, north limits of Bellaire, village of Central Lake, village of Mancelona, Antrim Co.;
Mich.—**MacLean Constr. Co.**, 731 E. Sheridan Rd., Lansing, Mich. LB $394,449. grading, aggregate surf. 7.398 mi. on M-213 from M-20 south of Muskegon River, Muskegon Co.;
Mich.—**Ann Arbor Constr. Co.**, 221 Felch St., Ann Arbor, Mich. LB $169,440. aggregate wid'n. 6.41 mi. on M-55 from US-27 westerly, Roscommon and Missaukee Counties;
Mich.—**W. F. McNally Co.**, Bridgeport, Mich. LB $108,632. c. conc. wid., 44 ft. wide bit. con. surf. 0.41 mi. on M-47 from Croak St. northerly to Weiss St. city of Saginaw, Saginaw Co. Bids June 6. CD 6/1 and 5/23.

BUILDINGS—LB & CA

▲ **Scholz Development Corp.**, 2001 N. Westwood St., Toledo, O. Owner Builds. $1,500,000. 104 HOMES, Anthony Wayne Village Development, between Michigan Ave. and Key St., MAUMEE, O.

▲ **J & E Constr. Co.**, 2199 S. Green Rd., Cleveland 21, O. Own Forces. $3,150,000. 126 HOMES, 33-acre site, LYNDHURST, O. CD 3/15.

▲ **J & E Constr. Co.**, 2199 S. Green Rd., Cleveland 21, O. Own Forces. $10,500,000. 525 HOMES, Clarkwood Estates, Green and Emery Rds., WARRENSVILLE HEIGHTS, O. CD 3/15.

▲ **Aluminum Co. of America**, 1200 Alcoa Bldg., Pittsburgh 19, Pa. Own Forces. $9,000,000. 14,000 tons EXTRUSION PRESS, LAFAYETTE, IND.

▲ **Chell & Anderson, Inc.**, 5425 N. Kedzie Ave., Chicago, Ill., LB $2,197,000. Prospect HIGH SCHOOL, gymnasium, ARLINGTON HEIGHTS, ILL. Arlington Twp. High School, 502 W. Euclid St., Arlington Heights, Ill. Bids June 6. CD 5/25.

▲ **J. C. O'Connor & Sons**, 2104 Miner St., Fort Wayne, Ind., CA Total Est. $6,000,000 site preparation for FACTORY ADDN., incl. 400,000 sq. ft. parts bldg.; 300,000 sq. ft. Building W addn.; 2 story office addn., JOLIET, ILL. Caterpillar Tractor Co., Peoria, Ill. CD 1/26;
Darin & Armstrong, Inc., 2041 Fenkell Ave., Detroit, Mich., CA, architectural trades (Joliet, Ill.);
Stanley Carter Co., Box 5598, Detroit 38, Mich., CA mechanical trades (Joliet, Ill.);
Hatfield Electric Co., 605 W. Washington Blvd., Chicago, Ill., CA electrical trades (Joliet, Ill.);
Mississippi Valley Structural Steel Co., Decatur, Ill. (1) structural steel (Joliet, Ill.);
Joseph T. Ryerson & Son, Inc., P.O. Box 8000-A, Chicago 80, Ill. (2) structural steel (Joliet, Ill.);
Federal Cement Tile Co., 608 S. Dearborn St., Chicago 5, Ill., CA roof deck (Joliet, Ill.);
J. L. Adler, Inc., 12-14 New St., Joliet, Ill., CA, roof insulation and flashing (Joliet, Ill.);
H. H. Robertson Co., 635 New Center Bldg., Detroit 2, Mich. (1) metal siding (Joliet, Ill.);

(Continued on page 69)

VERSATILE

Ruberoid Corrugated Asbestos Sheets

DURABLE

ECONOMICAL

DECORATIVE

Ruberoid Corrugated Asbestos combines durability . . . economy of installation . . . minimum upkeep . . . and unusual decorative possibilities — for many roofing and siding needs.

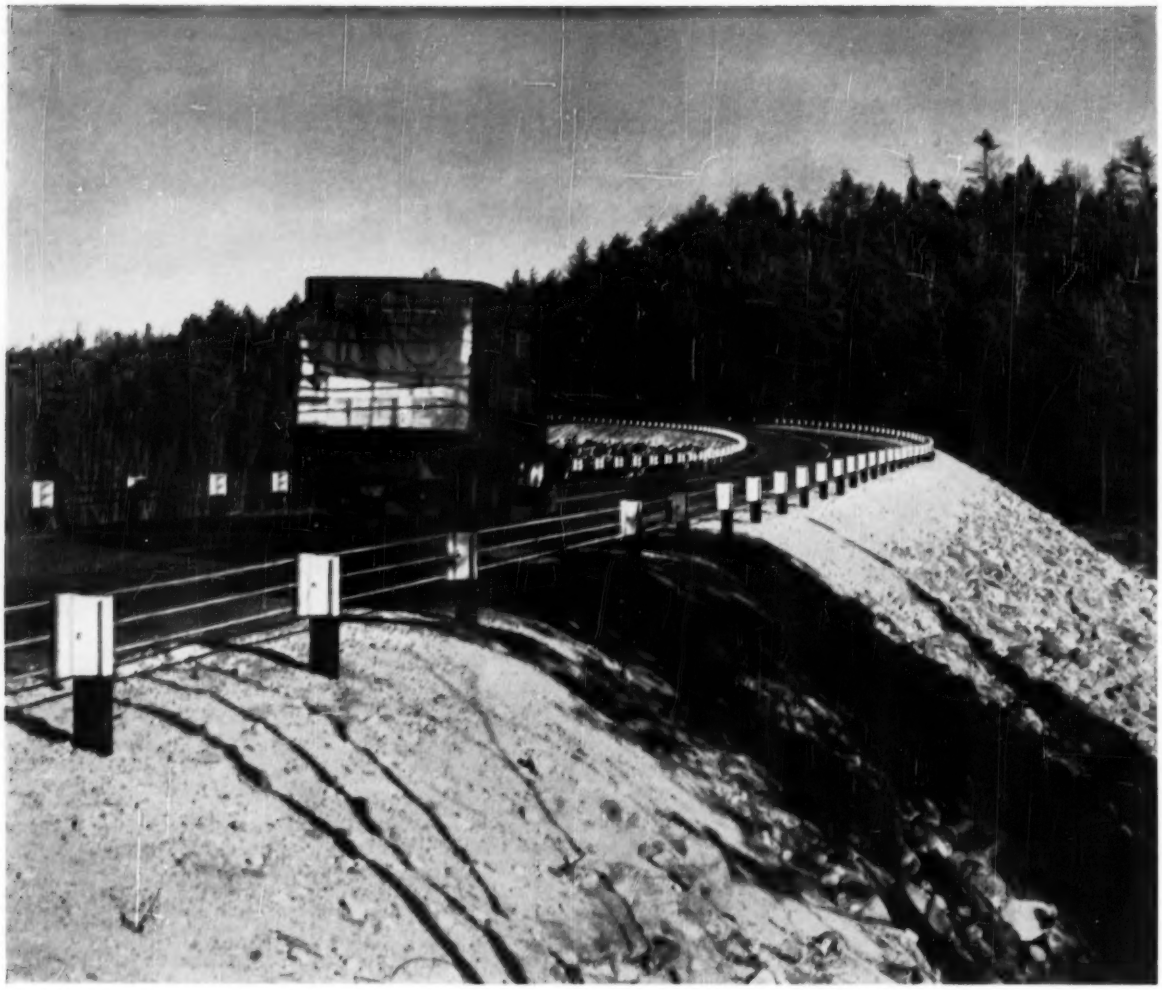
On the new Rock Of Ages Corp. plant in Barre, Vermont (upper left), these fireproof, noncorrosive sheets were selected to withstand severe climate changes, assure lasting durability in all weather. For the Shell Oil Co. Maintenance Shop #2 in Wood River, Illinois (center), Ruberoid Corrugated sheets made skeleton frame construction possible, required less costly footings. In addition to rugged, long life, Ruberoid Corrugated Asbestos can provide unusual decorative effects as in the Woodlawn Park Shopping Center, St. Petersburg, Florida (bottom).

Ruberoid Corrugated needs no paint to preserve it, requires virtually no maintenance over the years. It resists acids, fumes, smoke and steam, assures long life for any industrial or commercial use.

For more information, write:

The RUBEROID Co.

500 Fifth Avenue, New York 36, N. Y.



Protect Highway Danger Spots With Bethlehem Cable Guard Rail

Used at sharp turns, embankments, bridge approaches and other danger spots, along the highway, Bethlehem Cable Guard Rail forms a strong, effective barrier, with high resiliency and impact-absorbing qualities.

You can be sure of dependable protection for motorists when you install Bethlehem Cable Guard Rail. For this strong steel highway guard is designed to meet the demands of modern traffic, with its heavier volume and higher speeds.

Bethlehem Cable Guard Rail, with its special bumper-type bracket, is simple in design, easy to install, and low in cost. It requires little maintenance, can be used with either steel, wood or concrete posts, and is furnished to comply with any state regulations. It comes with 2, 3 or 4 cables, and with 1-, $1\frac{1}{4}$- or $1\frac{1}{2}$-in. anchor rods. Bethlehem furnishes cable guard rail, together with steel posts, brackets, cable ends, anchor rods, cable splicers and fittings, all of which assemble readily on the job.

If you would like to have more information about Bethlehem Cable Guard Rail or the solid-beam type of guard rail which we also make, just call the nearest Bethlehem sales office, or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

(Continued from page 66)

Plasteel Products Corp., Washington, Pa., CA (2) metal siding (Joliet, Ill.);
Jennison-Wright Co., 2463 Broadway, Toledo 9, O. CA wood block floors (Joliet, Ill.).

▲ **Alexander & Kingbay**, 4641 Hiawatha Ave., Minneapolis, Minn., CA Est. **$4,000,000.** SHOPPING CENTER, 45 stores, 2,500 car parking area, swimming pool, GREEN BAY, WIS. American Shopping Center, 2025 Nicolet Ave., Minneapolis, Minn.

▲ **O. E. Madsen & Son, Inc.**, Sexton Bldg., Minneapolis, Minn., CA **$1,130,500** ADULTS bldg. and school bldg., WATERTOWN, WIS. Bethesda Lutheran Home, Watertown, Wis. Bids May 28. CD 6/13, under LB.

▲ **Mack & Daily Co.**, 20019 W. Warren St., Detroit 28, Mich., Owner Builds. **$1,600,000.** Sylbert Drive Subdivision, 102 brick HOMES, Brady and Sylbert Sts., REDFORD, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲ **Kan., Wichita**—PAINT AND FINISH HANGAR—BA 11/21—**Boeing Airplane Co.**, Plant No. II, Personnel Bldg., paint and finish hangar. $1,250,000. Plans deposit $25. Wilson & Co., 705 E. Crawford St., Salina, engrs.

BUILDINGS—LB & CA

▲ **Ellington Miller Co.**, 25 E. Jackson Blvd., Chicago 4, Ill., CA **$2,000,000.** 160x1,000 ft. car constr. and repair SHOP, CLINTON, IOWA. Chicago & Northwestern Ry. Co., B. R. Meyers, Ch. Engr., 400 W. Madison St., Chicago 6, Ill.

▲ **Arthur H. Neuman & Bros. Inc.**, 514 Hubbell Bldg., Des Moines, Iowa, CA. Total est. **$2,700,000**, general constr., Bridgeport GENERATING STATION, EDDYVLILE, IOWA. Iowa Southern Utilities Co., Utilities Bldg., Centerville, Iowa. CD 2/8;
Winger Constr. Co., 1200 E. Main St., Ottumwa, Iowa, CA piping (Eddyville, Iowa);
Westinghousee Electric Corp., 3 Gateawy Center, Pittsburgh, Pa., CA turbo-generator (Eddyville, Iowa).

▲ **B & B, A. Y. and W. G. Building Companies**, 7567 St. Charles Rock Rd., Overland 14, Mo. Owner Builds. **$1,023,454.** eighty-seven, 1 story, brick RESIDENCE with 37x29 ft. garages, Hathaway Manor No. 6 subdivision, JENNINGS (St. Louis 21 P. O.), MO.

▲ **Farnsworth & Chambers Co. Inc.**, Box 74, Houston, Tex. LB **$1,375,000.** 10 story OFFICE tower; (above 5 story auto parking garage); LB **$471,000**, 5 story auto parking garage, HOUSTON, TEX. Melvin A. Silverman and Bennett Rose, 2923 Shenandoah St., Houston, Tex. Bids June 5. CD 5/23.

▲ **Still Meadows**, c/o A. R. Foster and P. S. Luttrell, 3205 N. Shepherd St., Houston, Tex. Own Forces. **$372,500**, 31 DWELLINGS; **$377,825**, 38 dwellings; **$355,000**, 35 dwellings, HOUSTON, TEX. Grand total $1,005,325. CD 4/12.

▲ **Jay's Lumber & Building Co.**, 8205 Chocolate Bayou, Houston, Tex., CA **$351,615**, 32 DWELLINGS; CA **$402,525**, 48 dwellings; CA **$389,200**, 40 dwellings, PORT ARTHUR, TEX. Grand total $1,143,340. Jay's Mortgage & Finance Co., c/o Jay's Lumber & Building Co., 8205 Chocolate Bayou, Houston, Tex. CD 4/17.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., San Francisco**—BA 7/11—City & County of San Francisco, c/o Dir. of Pub. Wks., City Hall, widen, realign streets, Market St. and Portola Dr., Hattie St. to Corbett St., Spec. 21,500, $2,733,660. Plans deposit $75. CD 4/27.

BUILDINGS—BA

▲† **Wash., Seattle**—RESIDENCE HALL—BA 7/10—University of Washington, Seattle, Zone 5, men's residence hall. $2,800,000. Extended date. CD 5/22.

BUILDINGS—SLC

Calif., Van Nuys—HOSPITAL—Valley Presbyterian Hospital, c/o Pereira & Luckman, archts., 9220 Sunset Blvd., Los Angeles, soon lets contract, 3 story 63-bed rein.-con hospital. $900,000.

HEAVY CONSTRUCTION—LB & CA

▲ **Ross B. Hammond**, 1241 N. Williams St., Portland, Ore., CA **$3,562,815.** terminal, Portland International Airport, PORTLAND, ORE. Port of Portland, Swan Island, Portland, Ore. Bids June 8, awarded June 11. CD 6/12, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Guy F. Atkinson Co., 10 W. Orange Ave., South San Francisco, Calif., LB **$2,818,146** (3 bidders) grading, paving 5.1 mi. freeway with frontage roads ramps and interchanges and five rein.-con. bridges and a culvert, US 101 between Santa Rosa and 0.8 mi. south of Wilfred Sonoma Co. Bids June 13. CD 5/17.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
Charles MacClosky Co. and Crowell & Larson, 152 Geneva Pl., Covina, Calif., CA **$3,236,026**, grading, paving 2.8 mi. 4-lane divided freeway, incl. 11 structures, San Bernardino Co. Bids June 1, awarded June 13. CD 6/6, under LB.

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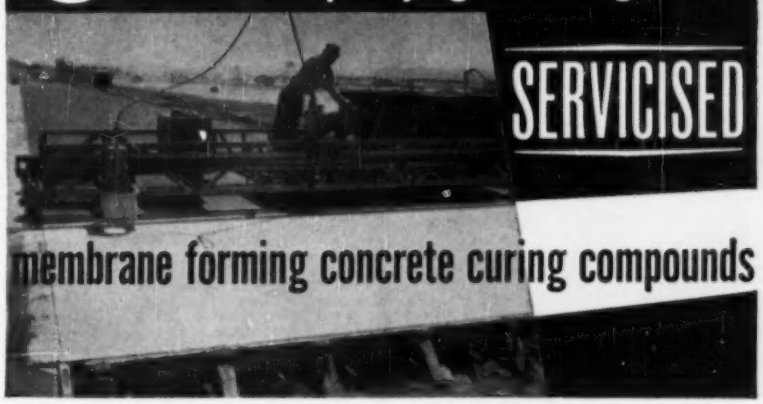

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OAKLAND 8 CALIFORNIA

▲ **Vido Artukovich & Sons, Inc.**, 11155 Rush St., El Monte, Calif., CA $4,192,247. est. $3,000,000. 7.8 mi. 72-in. pipe Middle Feeder Pipe Line, Baldwin Park and South San Gabriel, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern Calif., 306 W. 3 St., Los Angeles, Calif. Bids June 8, awarded June 12.

BUILDINGS—LB & CA

▲ **Haas & Haynie**, 275 Pine St., San Francisco, Calif., CA $1,857,300, two product engineering and advanced RESEARCH bldgs. SAN JOSE, CALIF. International Business Machines Corp., 25 Battery St., San Francisco, Calif. CD 1/13.

▲ **Charles M. and Kenneth Urton**, 725 Cacique St., Santa Barbara, Calif., LB $1,294,000 (5 bidders) general HOSPITAL, SANTA BARBARA, CALIF. Santa Barbara Co., Court House, Santa Barbara, Calif. Bids June 11. CD 6/1.

▲ **James Virusa**, Millbrae, Calif., **Joseph Vistuto**, Burlingame, Calif. and **Tony Rossi**, 299 El Camino Real, Millbrae, Calif. Owner Builds $2,000,000. 120 HOMES, Pine View Crest, SOUTH SAN FRANCISCO, CALIF. James Breen, 1 LaCruz Ave., Millbrae, Calif., engr.

▲ **Sun Gold Inc.**, Box 8, Riverside, Calif., Owner Builds, $1,599,000. 123 frame, stucco DWELLINGS, Sausolito, Drury and Janie Drives, WHITTIER, CALIF.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Neb., Omaha**—Metropolitan Utilities Dist., 18 and Harney Sts., 25 m. gal. water storage reservoir, 18-acre site, 132 and Dodge Sts. $2,000,000. Burns & McDonnell Engrg. Co., 95 and Troost Sts., Kansas City, Mo., consult. engr., J. C. Detweiler, c/o owner, water engr.

▲ **N. Y., Buffalo**—City, City Hall, water pumping station facing on Niagara Thruway incl. 4 pumps, $3,000,000. Nussbaumer, Clarke & Velzy, Inc., 327 Franklin St., Buffalo, consult. engr. CD 8/17/45.

SEWERS, WASTE DISPOSAL

▲ **Conn., Fairfield**—Town, sanitary sewers, 9 mi. laterals, West Half Tunxis Hill; East Trunk line, Hathan Hale St.; Kings Highway, Black Rock Tpk, Old Stratfield Rd., 2 ext. under Conn. Tupke, Round Hill Rd., Sasco Hill Rd., $1,750,000; sanitary sewers, Tunxis Hill area, Whitewood Rd., Candlewood Rd., Cedarhurst Dr., Fieldcrest Dr. $250,000. Bowe, Albertson & Assocs., 75 West St., New York, N. Y., consult. engrs. Frank E. Daniels, town engr. CD 1/9/47.

▲ **Ill., Alton**—City, sewerage system, $3,766,500. To start 1958.

▲ **Ill., Joliet**—City, Hickory Creek interceptor sewer. $1,000,000. CD 12/20/46.

▲ **Miss., Meridan**—City, imprv. sewerage system, $1,778,000.

▲ **Tex., Sweetwater**—City, sewage disposal system, $1,000,000; sewer col. lines, $350,000. Homer Hunter and Assocs., 3708 Abrams Rd., Dallas, consult. engrs.

BRIDGES

▲ **Ind., Indianapolis**—Comrs. Marion Co., Arthur W. Grayson, chn., County Court House, Zone 4, steel, concrete bridge and approaches at west edge of Indianapolis on W. 38 St. and White River. $3,000,000. CD 5/25.

▲ **NEW YORK**—State Pub. Wks. Dpt., The Gov. Alfred E. Smith State Office Bldg., Albany,
Albany and Rensselaer Counties—3 continuous truss spans with two 2 lane concrete traffic arteries 1.05 mi. over Hudson River from south of Selkirk to Castleton. $20,000,000. Bids on substructure in July or August.

EARTHWORK, WATERWAYS

▲ **Colorado**—Boettcher & Co., and John P. Elliott, 828 17th St., Denver, Colo. Homestate Water Proj., incl. Trans-Continental Divide Diversion into upper reaches of the Arkansas Valley near Leadville where addnl. water will be picked up and passed through a conduit and then through a hydro-electric plant. Part of this water will be pumped into Twin Lakes and will become part of Bureau of Reclamation Arkansas River Proj. The balance of the water estimated to be some 47,000 acre ft. annual will be used for domestic water supply, it will be carried by transmission lines from the power plant into South Platte Drainage by conduit. Colorado Springs and Aurora have options on part of this water, the balance it is hoped will be sold to Denver. The project is privately owned and is considered quite definite. est. $33,000,000. John P. Elliott, Colorado Bldg., Denver, Colo., consult. engr.

LATIN AMERICA

▲ **Argentina, Cordoba**—SLAUGHTER HOUSE, etc.—City of Cordoba, plans slaughter house and freezing plant. $1,400,000.

▲ **Colombia**—Govt. of Colombia, Bogota, rehabilitation of highways. $16,500,000. World Bank made loan.

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▲ **Venezuela**—PIPE LINE—Socony-Vacuum Co. and Sinclair Oil & Refining Co., Caracas, plans 212 mi. 20 in. oil pipe line from Barinas to Puerto Cabello. $24,600,000.

FOREIGN

▲ **India, Calcutta**—DAIRY PLANT—West Bengal Govt., Calcutta, plans dairy plant. $1,680,000.

PUBLIC BUILDINGS

▲ **Ariz., Tucson**—PARKING GARAGES—City, City Hall, two 4-story parking garages. $2,550,000.

▲ **Calif., Atwater**—SCHOOL—Bd. of Educ., Atwater, plans by Walter Wagner, 1830 Van Ness Ave., Fresno, Zone 1, high school, $1,573,800. CD 5/28.

▲ **Calif., Goleta**—PHYSICAL EDUCATION—University of Calif., Santa Barbara Campus, Santa Barbara, plans by Pereira & Luckman, 9220 Sunset Blvd., Los Angeles, physical educ. bldg. $1,800,000.

▲ **Calif., Hayward**—HIGH SCHOOL—Hayward Union High School Dist., c/o Supt., 22300 Foothill Blvd., Tennyson High School and site development, $3,273,882.

▲† **Calif., Los Angeles**—CUSTOM HOUSE, etc.—General Services Admin., General Services Bldg., Wash., D. C., custom house and federal office bldg. in Civic Center. $30,800,000. (No appropriation).

▲ **Colo., Grand Junction**—SCHOOLS—School Dist. 51, Grand Junction, voted bonds, junior and senior high school to replace present Central High, $1,000,000; elementary school, $650,000. CD 5/23.

▲ **Conn., Granby**—SCHOOL—Town, plans by Moore & Salisbury, 1007 Farmington Ave., West Hartford, high school, $1,000,000. CD 5/18.

▲ **Fla., Miami**—HIGH SCHOOL—Dade Co. Bd. Instruction, 275 N. W. 2 St., high school, north end of old municipal golf course at Pine Tree Dr. and 28 St., Miami Beach. $1,500,000. CD 11/3/55.

▲ **Fla., Tallahassee**—DORMITORIES—State Bd. Control, Florida State University, Tallahassee, mens' dormitory and womens' dormitory, $2,300,000.

▲† **Idaho, Arco**—REACTOR EXPERIMENT—Atomic Energy Comn., Idaho Falls, gas cooled reactor experiment at National Reactor Testing Station. $4,000,000. Engineers are invited to submit plans.

▲ **Ind., Logansport**—HOSPITAL ADDN.—Cass Co. Comrs. Court House, memorial hospital addn. and remodeling, $1,116,000-$1,370,000. CD 11/17.

▲ **Mich., East Lansing**—DEPARTMENT OF ARTS—State, A. N. Langius, dir., State Bldg. Dpt., Lewis Cass Bldg., Lansing, plans by Ralph R. Calder, 1212 Kales Bldg., Detroit, Zone 26, department of arts bldg. Michigan State University, $1,500,000.

▲ **Mich., Farmington**—SCHOOL—City, 33312 Grand River plans by Smith, Tarapata, MacMahon, Inc., 894 S. Adams Rd., Birmingham, junior high school, $1,000,000. CD 4/5.

▲ **Mich., Grand Rapids**—WHOLESALE MARKETING CENTER—City, Donald Oakes, city mgr., City Hall, wholesale marketing center, $1,500,000.

▲ **Mich., Hazel Park**—SCHOOL—City, Bd. Educ., 22750 Highland St., defeated $8,500,000 bonds June 11, schools. Jahr-Anderson Assoc., Inc., 15011 Michigan Ave., Dearborn, archts. CD 6/1.

▲ **Mich., Lapeer**—BUILDINGS—State, A. N. Langius, dir., State Bldg. Dpt., Lewis Cass Bldg., Lansing, plans by Smith, Tarapata, MacMahon, Inc., 894 S. Adams St., Birmingham, alterations to bldgs. and constr. of central kitchen, Lapeer State Home and Training School, $1,000,000. CD 1/23/52.

▲ **Mich., Lapeer**—NURSERY—State, A. N. Langius, dir., State Bldg. Dpt., Lewis Cass Bldg., Lansing, plans by Smith, Tarapata, MacMahon, Inc., 894 S. Adams St., Birmingham, nursery, $2,000,000. CD 11/9.

▲ **Mich., Paw Paw**—SCHOOLS—Van Buren Twp. Bd. Educ., Melvin C. Budd, School Bd., junior high school, elementary school, school addns., Van Buren, $2,500,000.

▲ **Mo., Columbia**—HOSPITAL—Boone County Hospital, Bd. Trustees, James W. Hourigan, chn., Columbia, voted $3,000,000 bonds May 29, Boone County Hospital addn. O. W. Stiegemeyer, 3 Sheraton Dr., St. Louis County, Zone 24, archt. CD 5/1.

▲ **Mo., Jefferson City**—PENITENTIARY—State, Div. Pub. Bldgs., Ralph McSweeney, dir., 100 State Capitol Bldg., remodeling, repairs and equip. of women's division and prison farms, $3,400,000; dormitory, equip., repairs women's division, State Penitentiary $950,000. CD 6/3/55.

▲ **N. J., Asbury Park**—HOUSING—Asbury Park Housing Auth., Asbury Park, plans by Bernard Singer, 15 Benmore Terrace, Bayonne, 249-unit housing project, $1,000,000.

▲ **N. J., West Paterson**—SCHOOL—Bd. Educ., Borough of West Paterson, plans by Emil Ciccone, 478 McBride Ave., Paterson, grade school adjoining School No. 4 off McBridge Ave. $1,250,000. CD 6/12.

▲ **N. Y., Liverpool**—SCHOOL—Liverpool Central School Dist., $1,080,000 bond election June 14, elementary school.

▲ **O., Oxford**—HOUSING—Miami University (Ohio Pub. Wks. Dpt.) U. S. granted $1,000,000 loan for housing for married students, 4 apartment bldgs., each containing 8 one-bedroom and 19 efficiency apartments.

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▲ **O., Sharonville**—SCHOOLS—Princeton Local School Dist., 336 Reading Rd., plans by Potter, Tyler, Martin & Roth, 126 E. 6th St., Cincinnati, high school. $3,500,000. Fosdick & Hilmer, Union Trust Bldg., Cincinnati, consult. engrs.; plans by A. M. Kinney, Inc., Vernon Pl., Cincinnati, archt.-consult. engrs., elementary school. $600,000. Bids early 1957. CD 5/31.

▲ **Pa., Catasauqua**—SCHOOL—Catasauqua Union School Board, plans by H. E. F. Everett, Commonwealth Bldg., Allentown, high school, $1,500,000. Bids soon.

▲ **Pa., Honesdale**—SCHOOL—Honesdale Union School Dist., Boro Hall, plans by Wolf & Han, 459 Hamilton St., Allentown, high school, $2,500,000.

▲ **Tex., Beaumont**—HOSPITAL—St. Elizabeth's Hospital, Beaumont, hospital, $3,000,000.

▲ **Tex., Garland**—SCHOOLS—Garland Ind. School Dist., voted bonds May 29, Jr. High School unit, $750,000, group of school repairing, $350,000, elementary school $400,000. CD 5/4.

▲ **Tex., Houston**—JUVENILE DETENTION, etc.—Harris Co., c/o Courthouse, $1,000,000 bond election, July 28, Juvenile Detention and Probation Bldg.

▲ **Tex., Orange**—SCHOOLS—Orange Independent School Dist., Orange, voted bonds, administration and hall bldg. $350,000; elementary school No. 1, $350,000; elementary school No. 2, $375,000. (Correction—owner). CD 6/8.

▲ **Va., Princess Anne**—SCHOOLS—Princess Anne Co., Court House, $1,300,000 bond election July 10, schools.

▲ **Wash., Seattle**—CITY LIGHT BLDG. ADDN.—City, County-City Bldg., Zone 4, plans by Decker, Christenson & Kitchen, 1411 4th Ave. Bldg. and Jones & Bindon, Hoge Bldg., 5 story City Light bldg. addn. $2,100,000. Bids likely this year.

COMMERCIAL BUILDINGS

▲ **Calif., Fort Ord**—HOUSING—U. S. Eng., 180 New Montgomery St., San Francisco, plans by Angus McSweeney, 612 Howard St., San Francisco, construct and finance 189-units of housing. $2,457,000.

▲ **Calif., Oakland**—HOUSING—U. S. Eng., 180 New Montgomery St., San Francisco, plans by Angus McSweeney, 612 Howard St., San Francisco, construct and finance 88-units of family housing. $1,144,000.

▲ **Calif., Travis Air Force Base**—HOUSING—U. S. Eng., 180 New Montgomery St., San Francisco, plans by Angus McSweeney, 612 Howard St., San Francisco, construct and finance 86-units family housing, $1,118,000; construct and finance 80 units of family housing, $1,040,000.

▲ **Conn., Huntington** — HOUSING — Norris Rossinoff, Meadow Crest Dr., Fairfield, 100 house development, Soundview Ave., $1,000,000.

▲ **Ill., Chicago**—ORPHANAGE ADDN.—Angel Guardian Orphanage, 2001 W. Devon Ave., Chicago, plans by Gaul & Voosen, 228 E. Superior St., Chicago, orphanage addn., office, auditorium, gym, grade and high school and infirmary, $1,750,000.

▲ **Ill., Chicago**—INSURANCE OFFICE—United Insurance Co., 1313 S. Michigan Ave., plans by Shaw, Metz & Dolio, 208 S. La Salle St., Insurance office bldg., 5700 blk., east side of Sheridan Rd., $1,000,000.

▲ **Ill., Joliet**—HOSPITAL—Sisters of St. Joseph's Hospital, 372 N. Broadway, 600-bed hospital, west of Larkin Rd. $5,000,000.

▲ **Ky., Lexington**—HOSPITAL—St. Joseph's Hospital, Sisters of Charity, 1701 Dixie Hy., Lookout Heights, plans by Potter, Tyler, Martin & Roth, 128 E. Sixth St., Cincinnati, O., 7 story, bsmnt., rein.-con., brick hospital, boiler plant, laundry, paving, $4,250,000. Proctor Ingles, 915 S. Limestone St., consult. engr. CD 1/4.

▲ **La., Shreveport**—OFFICE, etc.—F. C. McClanahan, Sr., Box 4303, plans by Joseph Schierer, 976 Jordan St., 10 story office bldg. and 6-story connecting parking garage, Fairfield Ave. & Margaret Place, $3,000,000.

▲ **Mich., Albion**—CHAPEL—Albion College, Bd. Trustees, Albion, Goodrich Chapel on campus. $1,000,000.

▲ **Minn., Golden Valley** (P. O. Mpls.)—SCHOOL—Lutheran Bible Institute, 1619 Portland Ave., Minneapolis, group of school bldgs., Olson Hy. and Douglas Dr., $1,000,000. To begin this yr.

▲ **Minn., Minneapolis**—HOSPITAL—St. Mary's Hospital, 2500 S. Sixth St., plans by Hills, Gilbertson & Hayes, 6009 Wayzata Blvd., 7 story T-shaped hospital wing, remodel existing bldg. $5,000,000. CD 4/22/54.

▲ **Mo., St. Louis**—HOTEL—Martin O'Brien Israel, pres., Martin-Steven Realty Co., 1536 Market St., St. Louis, Zone 3, plans by Edward F. Gordon, 8230 Forsyth Blvd., Clayton, Zone 24, 15-story hotel and office, Market St. between 15 and 16 Sts., $12,000,000.

▲ **Mont., Great Falls**—AUDITORIUM—Cascade Co., Court House, "Wheat Palace" multi-purpose auditorium. $2,231,000. Petitions being circulated asking special bond election Nov. 6 on $2,231,000 bond issue.

▲ **N. Y., Clinton**—DORMITORY—Hamilton College, freshman dormitory to house 240 students, $1,250,000.

▲ **N. Y., New York**—APARTMENT—Evan M. Frankel, 225 E. 46 St., Zone 17, 20 story 100x175 ft. apartment at northeast corner of 53 St. and First Ave., $2,000,000.

▲ **O., Sandusky**—HOMES—Hinde Development Corp., Charles Mauch, pres., 1503 Columbus Ave., 408 homes at "Fairview Lanes" on Perkins Ave. $5,000,000-$5,500,000.

▲ **Tex., Grand Prairie**—DWELLINGS—Centex Construction Co., Inc., 4606 Greenville St., Dallas, 33 dwellings, $363,110; 36 dwellings, $373,331; 36 dwellings, $344,900; 28 dwellings, $345,500; 38 dwellings, $380,000. Off South Belt Line Road.

▲ **Tex., Grand Prairie**—DWELLINGS—R. W. Baxter, Rio Grande Nat'l Bldg., Dallas, 20 dwellings, $355,000; 18 dwellings, $346,500; 23 dwellings, $373,330; 21 dwellings, $365,100; 25 dwellings, $379,345; 16 dwellings, $345,850; 30 dwellings, $389,910, all in International Estates Subdivision.

▲ **Tex., Grand Prairie**—DWELLINGS—Sharp & Co., 3201 Oak Grove St., Dallas, 29 dwellings, $365,500; 32 dwellings, $370,000; 28 dwellings, $359,120; 34 dwellings, $368,119; 36 dwellings, $379,000; 25 dwellings; $350,000, in area off S. Belt Line Rd.

▲ **Tex., Grand Prairie**—SHOPPING CENTER—Sharp & Co., Inc., 3201 Oak Grove St., Dallas, shopping center, 75-acre plot off S. Belt Line Rd. $2,500,000.

▲ **Utah, Salt Lake City**—MOTEL—Hotel Utah, Max C. Carpenter, mgr., Salt Lake City, plans by L. Robert Gardner, 173 South Second West, 175-unit motel, 600-1,000 seating capacity auditorium, $1,500,000. Bids for main bldg. some time next month.

▲ **Va., Arlington**—OFFICE—Carl Hengen, 4501 26th St. N., plans by John Fitzsimmons, 1731 New Hampshire Ave., N. W., Wash., D. C., 8 story 100,000 sq. ft. office, 4415 Wilson Blvd. $2,000,000.

▲ **Alta., Edmonton**—HOTEL, etc.—Security Loan & Investment Co., Edmonton, 4 story hotel and office $1,500,000.

INDUSTRIAL BUILDINGS

▲ **Colorado and Utah**—URANIUM PROCESSING MILL—Union Carbide Nuclear Co. (Union Carbide & Carbon Corp.), 30 E. 42 St., New York, N. Y., uranium processing mill at Rifle, Colo., two ore upgrading and receiving stations, one at Slick Rock, San Miguel Co., Colo. and one at Green River, Emery Co., Utah. Construction to start soon. $4,500,000.

▲ **Mo., St. Louis**—PLANT FACILITIES—Glidden Company, Dwight P. Joyce, chairman and pres., Central Region Ofcs. & Fcty., Berea & Madison, Cleveland, O., plant facilities factory addn., 106 Gratiot St. or new plant at another site, $1,000,000.

▲ **Tex., Abilene**—INDUSTRIAL CENTER—Jack Hughes, et al, 3210 College St., industrial center, (bldgs. only), 818 acre site north of T. & P. Ry., $45,000,000.

▲ **Tex., Sweetwater**—MILL, etc.—Flintkote Co., I. J. Harvey, pres., 30 Rockefeller Plaza, New York, N. Y. gypsum mill, $8,000,000; storage or warehousing unit, $500,000.

▲ **Ont., Tornto**—FACTORY—Hygrade Containers Ltd., c/o Canadian International Paper Co., Ltd., Sun Life Bldg., Montreal, Que., 15,000 sq. ft. factory, $3,000,000. Foundation of Canada Engineering Corp. Ltd., 200 Bloor St. E., Toronto, consult. engrs.

UNCLASSIFIED

▲† **Ariz., Fort Huachuca**—UTILITY SYS. etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., utility sys., roads, motor park facilities, barracks. $3,000,000. Headman, Ferguson & Carrollo, 3308 N. 3 St., Phoenix, consult. engrs. CD 8/2.

▲† **Connecticut**—HOUSING—U. S. Eng., 150 Causeway St., Boston, Mass., 248 housing units, Defense Area Hartford Area; 128 units East Windsor Route 140; 5/16 units Glastonbury; 36 units Portland; 16 units Middleton; 16 units Plainville; 32 units Simsbury; 16 units Bridgeport Area; 16 units Ansonia, Milford, Westport and Monroe; 28 units Fairfield and Orange. $3,348,000. Moore & Salsbury, 1007 Farmington Ave., West Hartford, archts.

▲† **Kentucky**—NATIONAL PARK—National Park Service, Dpt. Interior, 19 and C Sts. N. W., Wash. 25, D. C., constr. roads, trails, $1,831,000; constr. and utilities $1,688,000, Mammoth Cave National Park, No appropriation. CD 3/5.

▲† **Maine**—NATIONAL Park—National Park Service, Dpt. Interior, 19 and C Sts. N. W., Wash. D. C., constr. and impvr. of roads and trails, $4,960,000; buildings and utilities, $1,129,000, Acadia National Park. No appropriation. CD 3/5.

▲† **Michigan**—NATIONAL PARK—National Park Service, Dpt. Interior, 19 and C Sts. N. W., Wash., D. C., buildings, harbor facilities, utilities, $2,002,000; trails and small docks, $92,000, Isle Royale National Park. No appropriation. CD 7/19/55.

▲ **N. J. Paterson**—PARKING AREAS—Paterson Parking Auth., Paterson, 4 new parking areas, $1,500,000. Tippetts-Abbett-McCarthy-Stratton, 62 W. 47 St., New York, N. Y. consult. engrs.

▲† **New Mexico**—NATIONAL PARK—National Park Service, Dpt. Interior, 19 and C Sts. N. W., Wash., D. C., constr. buildings, and utilities, $835,000; imprv. and expansion of roads and trails, $441,000, Carlsbad Caverns National Park. No appropriation.

▲ **Texas**—TELEPHONE LINES, etc.—Texas Telephone & Telegraph Co., Main St., mostly lines, and some system imprvs. in Houston. $6,985,000. CD 6/15/53.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲ **CONNECTICUT**—State Hy. Comr., State Office Bldg., Hartford,
D. V. Frione Co., Inc., 87 Foxon St., New Haven, Conn. CA **$2,354,071**, b. conc. 10,896 lin. ft., incl. grade separation structure at Station 72 plus 0, Proj. 316B-01, West Haven and New Haven. Bids May 21. CD 5/23, under LB.

▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford,
Conn.—**Merritt-Chapman & Scott Corp.**, 260 Madison Ave., New York, N. Y., LB **$9,179,912** (9 bidders) Proj. 326-01, grading, drainage, b. conc. 45,832 lin. ft. Conn. Tpke., incl. 13 grade separation structures, 2 structures crossing stream and railroad tracks, one rein.-con. box culvert, Montville and Norwich;
Conn.—**M. A. Gammino Constr. Co.**, 728 Valley St., Providence, R. I. and **Brunalli Constr. Co.**, Summer St., Southington, Conn., LB **$6,699,690** (7 bidders) Proj. 327-01, grading, drainage, b. conc. 37,684 lin. ft. Conn. Tpke., incl. 8 grade separation structures, 4 rein.-con. box culverts, Norwich and Lisbon;
Conn.—**Arute Bros., Inc.**, 560 S. Main St., New Britain, Conn., LB **$3,042,485** (8 bidders) Proj. 325-01, grading, drainage, b. conc. 24,693 lin. ft. Conn. Tpke., incl. 5 grade separation structures, 5 rein.-con. box culverts, Waterford and Montville. Bids June 18. CD 5/31.

BUILDINGS—LB & CA

▲ **B. Perini & Sons, Inc.**, 73 Montwait Ave., Framingham, Mass. LB **$2,509,000.** high SCHOOL, Walnut St., FRAMINGHAM, MASS. Town, School Bldg. Comn., c/o supt. schools, Union Ave., Framingham, Mass. Bids June 15. CD 5/25.

▲ **A. F. Squillacote Co.**, 84 Market Sq., Newington, Conn., CA **$1,440,000.** combined bid, Jerome Ave. and Mix Sts. and Stafford and Grove Aves. Elementary SCHOOLS, BRISTOL, CONN. Town, High School Bldg. Bristol, Conn. Bids May 22, awarded June 14. CD 5/25, under LB.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., New York**—OFFICE—BA 7/9—IBM World Trade Corp., 807 United Nations Plaza, Zone 17, 11 story office at 348-50 E. 46 St. and 819-21 First Ave., over $1,000,000. Harrison & Abramovitz, 630 Fifth Ave., Zone 20, archts. CD 10/4/55.

HEAVY CONSTRUCTION—LB & CA

▲† **Michael Contg. Co., Inc.**, 142 19 St., Brooklyn 32, N. Y. CA **$1,376,988.** Nike site Rte. 33 town of Lancaster, NEW YORK. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids May 23, awarded June 13. CD 5/25, under LB.

▲ **Fehlhaber Constr. Co.**, 217 E. 49 St., New York 17, N. Y. LB **$3,472,413.** (2 bidders) demolition of Piers 35 and 36, dredging and constr. bulkhead and fill for proposed Pier 11 at Atlantic Basin, Contr. BP-12.001, BROOKLYN, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids June 19. CD 5/22.

BUILDINGS—LB & CA

▲ **John W. Cowper Co.**, Sidway Bldg., Buffalo, N. Y. CA **$3,000,000.** 7 story ADMINISTRATIVE Bldg., BUFFALO, N. Y. Marine Trust Co., 237 Main St., Buffalo, N. Y. Awarded June 13.

▲ **Green Tree Manor Homes**, c/o Alwin Cassens Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds, **$4,000,000.** 300 HOUSES, LINDENHURST, N. Y.

▲ **Del-Ray Beach Homes**, 3210 Brigantine Blvd., Brigantine, N. J. Separate Contracts. $3,500,000. RESIDENTIAL development, SOMERS POINT, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, archt.

▲ **John McShain, Inc.**, 1501 N. Arlington Rd., Arlington, Va. LB **$6,867,000.** general constr., state OFFICE, Broad and Spring Garden Sts., PHILA., PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids June 20. CD 6/6;
Williard, Inc., Germantown and Sedgeley Aves., Phila., Pa. LB **$1,089,000.** heating, ventilating, and air-conditioning work. (Phila., Pa.);
Atlas Mechanical Corp., 67 N. 63 St., Phila., Pa. LB **$363,000.** plumbing work. (Phila, Pa.);
Electric Power Constr. Co., 3858 Pulaski Ave., Phila., Pa. LB **$937,000.** electrical work. (Phila., Pa.);
Haughton Elevator Co., 1725 Fairmount Ave. Phila., Pa. LB **$671,349.** elevators and dumbwaiter work. (Phila., Pa.).

▲† **John Tester Sons, Inc.**, Clinton, Md. LB **$2,137,217**, Item 1: **$1,992,217**, Item 2: P.I.C. bldg. and film vaults, SUITLAND, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids June 20. CD 5/25.

▲ **Harbor Estates**, c/o B. Jenkins, Delaware City, Del. Separate Contracts. $3,000,000. RESIDENTIAL development, DELAWARE CITY, DEL.

▲ **Foulk Woods Constr. Co.**, 1931 Foulk Rd., Wilmington, Del. Separate Contracts. **$1,800,000.** 120 RESIDENCES, Foulk Rd., etc. WILMINGTON, DEL.

SOUTH

BUILDINGS—BA

▲ **Ala., Listerhill**—PLANT—BA 8/1—Ford Motor Co., The American Rd., Dearborn, Mich., aluminum casting plant. $25,000,000. CD 1/18.

HEAVY CONSTRUCTION—LB & CA

▲† **VIRGINIA**—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington,
Nello L. Teer, P. O. Box 1131, Durham, N. C., CA **$1,621,755**, paving, etc. from Ballard Creek to Yorktown and Williamsburg to Jamestown Island Colonial Parkway, York and James City Counties. Bids May 22. CD 5/31, under LB.

▲† **Blythe-Conner Co.**, 3468 Westminster Ave., Norfolk, Va., CA **$1,448,400**, guided missiles school and barracks, Fleet Air Defense Training Center, NOy 89488. Spec. 47346. DAM NECK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval 3ase, Norfolk 11, Va. Bids May 15. CD 5/17, under LB.

▲ **Mountain State Constr. Co.**, St. Albans Rd., South Charleston, W. Va. CA **$1,300,778.** Contr. No. 1 interceptor sewers in Downtown and Montrose School areas, SOUTH CHARLESTON, W. VA. Sanitary Bd. of city of South Charleston, City Bldg., South Charleston, W. Va. CD 5/16, under LB.

▲† **Pittsburgh-Des Moines Steel Co.**, Neville Island, Pittsburgh, Pa., LB **$3,964,315**, est. $2,741,528, steel scoop and diffuser for Arnold Engineering Development Center, TULLAHOMA, TENN. U. S. Eng., P. O. Box 2091, Tullahoma, Tenn. Bids May 22. CD 5/18, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Mich., Ann Arbor**—ENGINEERING BLDG.—BA 7/17—Regents of the University of Michigan, W. K. Pierpont, vice pres., Plant Service Bldg., Fluids Engineering Bldg. Proj. No. 78. $1,950,000. Plans deposit $50, refundable. Giffels & Vallet, Inc., 1000 Marquette Bldg., Detroit, Zone 26, archt. CD 12/4/53.

HEAVY CONSTRUCTION—LB & CA

▲† **Maxon Constr. Co.**, 2600 Far Hills Rd., Dayton 9, O. LB **$1,512,709.** est. $1,500,679 (3 bidders) air intelligence bldg., Area A, Wright Patterson Air Force Base, Eng. 15-059-56-27. DAYTON, O. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids June 19. CD 5/24.

▲ **Witter-Gaddis Corp.**, Schererville, Ind., CA **$4,501,306.** new Chase St. interceptor sewer, addnl. local sewer, booster plant and lift station, GARY, IND. Bd. Sanitary Comrs., City of Gary, City Hall, Gary, Ind. Bids June 1. CD 6/12, under LB.

▲ **Union Building & Constr. Co.**, 631 Main Ave., Passaic, N. J., LB **$2,806,400.** two 4-story, 9-parking levels, rein.-con. carports, GARY, IND. City, City Hall, Gary, Ind. CD 12/21.

▲ **S. A. Healy Co. and Gargaro Co.**, 6561 E. 7 Mile Rd., Detroit, Mich. LB **$1,481,578.** West Sanitary trunk sewer, Sec. 3A, 9,000 ft. 54- to 84-in., 900 ft. 10-in., junction chamber; Sec. 3B, 22,000 ft. 42- to 54-in. with appurtenances; Sec. 3C, 4,000 ft. 36-in. with appurtenances, VAN DYKE, MICH. Warren Twp., 22720 Van Dyke Ave., Van Dyke, Mich. Bids May 28. CD 5/15.

BUILDINGS—LB & CA

▲ **Grant-Halladay Constr. Co.**, Callahan Bldg., Dayton, O. Owner Builds. **$4,000,000.** 365 HOMES, 80-acre site Martindale Rd. between Canton and nearby Middlebranch, CANTON, O.

▲ **Schirmer-Peterson Constr. Co.**, 6830 Beaver Ave., Cleveland, LB **$4,537,251**, (2 bidders) OUT-PATIENT BLDG., CLEVELAND, O. City, Dpt. Health & Welfare, Bell Greve, Dir., City Hall, Cleveland 14, O. Bids June 14. CD 5/8.

▲ **Steinle-Wolfe Inc.**, 128 N. Jefferson St., Fremont, O. CA **$1,645,114.** Blanchard Valley HOSPITAL, FINDLAY, O. Hancock Co. Comrs., Court House, Findlay, O. Bids May 4. CD 4/18.

▲ **Bernard Greenbaum Assocs.**, 59 E. Van Buren St., Chicago, Ill., Owner Builds. **$2,000,000.** 32 store SHOPPING CENTER, Westgate Village Shopping Center, W. Central Ave. and Secor Rd., TOLEDO, O. CD 11/3/54.

▲ **Westinghouse Electric Corp.**, Toledo Trust Bldg., Toledo, O., CA Total est. **$22,000,000**, generator for Bay Shoe GENERATING PLANT ADDN. for 135-kw. turbine generator and auxiliary equip. 100x356 ft. main bldg. addn., generator, boiler, substation facilities, circulating water sys. etc. TOLEDO, O. Toledo Edison Co., Edison Bldg., Toledo, O. George W. Saathoff, 95 River St., Hoboken, N. J., consult. engr., P. H. Gravelle, c/o owner, engr. CD 10/9/52;
Babcock & Wilcox Co., 4712 Bay Shore, Toledo, O. CA, boiler for Bay Shoe Generating Plant (Toledo, O.);
A. Bentley & Sons, Inc., 201 Belmont St., Toledo, O., CA, general constr. of Bay Shoe Generating Plant (Toledo, O.).

(Continued on page 76)

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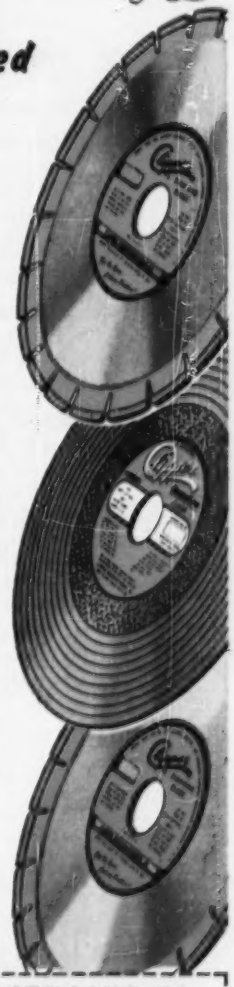

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(Continued from page 74)

▲ **Chell & Anderson, Inc.**, 5425 N. Kedzie Ave., Chicago, Ill., CA **$2,197,000** bldg. only. Total **$3,373,655**. Prospect HIGH SCHOOL and gymnasium, Foundry Rd. ARLINGTON HEIGHTS, ILL. Arlington Twp. High School, 502 W. Euclid St., Arlington Heights, Ill. Bids June 6. CD 6/18, under LB.

▲ **S. N. Nielsen Co.**, 3059 W. Augusta Blvd., Chicago 22, Ill. CA **$2,668,968**. high SCHOOL addn., and gymnasium, DOWNERS GROVE, ILL. School Dist. 99, 936 Warren St., Downers Grove, Ill. CD 5/22, under LB.

▲ **B. W. Constr. Co.**, 39 S. LaSalle St., Chicago 3, Ill. CA **$2,500,000**. 3 story 160,000 sq. ft department STORE, Harlem, Irving Park and Forest Preserve Dr. parking facilities, NORRIDGE, ILL. Wieboldt Stores, Inc., 820 Davis St., Evanston, Ill. Barancik & Conte, 919 N. Michigan Ave., Chicago, archts.

▲ **Hunzinger Constr. Co.**, 4577 N. 124 St., Milwaukee, Wis., CA Est. **$5,000,000**. 1 story 338x644 ft. mfg. PLANT, Oak Creek, MILWAUKEE, WIS. A. C. Spark Plug Div., General Motors Corp., 1925 E. Kenilworth Ave., Milwaukee, Wis. Bids June 12. CD 5/28.

▲ **Barton-Malow Co.**, 2631 Woodward St., Detroit 1, Mich. CA Est. **$3,000,000**. 200,000 sq. ft. Plymouth Division PLANT addn., PLYMOUTH, MICH. Burroughs Corp., 6071 Second St., Detroit, Mich. Bids May 8. CD 5/7.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ **Iowa, Fort Dodge**—HIGH SCHOOL, etc.—BA 7/19—Bd. Educ. Fort Dodge, high school, junior college bldg. $1,800,000. Extended date. Smith, Voorhees, Jensen, Silletto & Assocs., 206 Davidson Bldg., Des Moines, archts. CD 5/8.

BUILDINGS—LB & CA

▲ **M. W. Watson Constr. Co.**, National Bank of Topeka Bldg., Topeka, Kan. CA **$1,025,000**. general constr., 4 story, 39x228 ft., 5 story, 39x228 ft. brick, rein.-con., men's DORMITORIES with 2 story 74x110 ft. cafeteria bldg., COLUMBIA, MO. Curators of University of Missouri, Dale O. Bowling, bus. mgr., 123 Jesse Hall, Columbia, Mo. Bids, June 8. CD 5/4.

▲ **Builders Constr. Co.**, Kerr-McGee Bldg., Oklahoma City, Okla., CA **$2,081,697**. est. $2,000,000. LIBRARY ADDN., University of Oklahoma, NORMAN, OKLA. Bd. Regents, Capitol, Oklahoma City 5, Okla. Bids June 14, awarded June 15. CD 5/15.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Washington**—BA 7/18—Chelan County Public Utility Dist., 327 N. Wenatchee Ave., Wenatchee, Stage 1 of $200,000,000 Rocky Reach Hydro Dam, incl. first-stage cofferdam, left abutment, etc. Stone & Webster Engrg. Corp., 49 Federal St., Boston, Mass., engr. CD 2/3/55.

HEAVY CONSTRUCTION—LB & CA

▲ **Tolboe & Harlin Constr. Co.**, 3091 S. Main St., Salt Lake City, Utah, CA **$1,212,575**. est. $1,900,000. water treatment plant, SALT LAKE CITY, UTAH. Salt Lake City Corp., R. W. McLesse, city engr., City-County Bldg., Salt Lake City, Utah. Bids June 7. CD 5/24.

▲ **WASHINGTON**—State Hy. Comn., Olympia, **Morrison-Knudsen Co., Inc.**, 319 Broadway, Boise, Idaho and **Rumsey & Co.**, 3821 Airport Way, Seattle, Wash., CA **$2,826,615**. 3,400 ft. 2-level rein.-con. girder sect. of Alaskan Way viaduct in Seattle north of Holgate St., FAP U-001-3 (12), King Co. Bids June 19. CD 5/23.

▲† **Mittry Constr. Co.**, 2960 Marsh St., Los Angeles 39, Calif., CA **$6,179,639**. Vaquero Dam and access road to Santa Maria Proj. near Santa Maria. Spec. DC 4676. CALIFORNIA. Bureau Reclamation, Dpt. Interior, Santa Maria, Calif. Bids June 1. CD 6/5, under LB.

▲† **Guy F. Atkinson**, 10 W. Orange Ave., South San Francisco, CA **$7,467,750**. Coyote Valley Dam on Russian River, 7 mi. northeast of Ukiah, Mendocino Co., CIVENG-56-94, CALIFORNIA. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids June 5. CD 6/8, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento.

A. **Teichert & Son, Inc.**, 1931 Stockton Blvd., Sacramento, Calif., CA **$2,784,349**, freeway constr. US 99 between 0.7 mi. south of Galt and 1.6 mi. south of Cosumnes River, 7.2 mi. incl. 12 bridges, two pumping plants, Sacramento and San Joaquin Counties. Bids June 6, awarded June 18. CD 6/11, under LB.

BUILDINGS—LB & CA

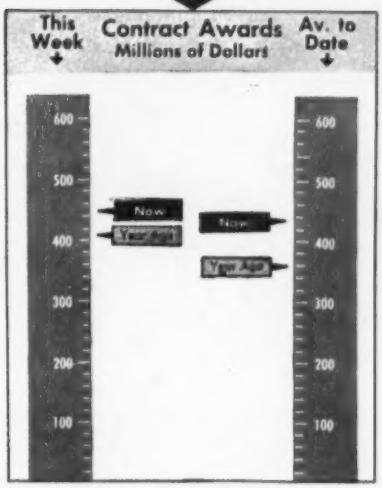
▲ **L. H. Hoffman**, 715 S. W. Columbia St., Portland, Ore. CA total est. **$2,000,000** (2 bidders) kraft recovery FURNACE HOUSE, CAMAS, WASH. Crown-Zellerbach Corp., 343 Sansom St., San Francisco, Calif. Bids June 8. CD 4/12.

▲ **A. V. Petersen**, Box 2368, Medford, Ore., LB $2,040,404. (5 bidders) HOSPITAL, MEDFORD, ORE. Medford Hospital Assn., Medford, Ore. Bids June 12. CD 5/28.

▲ **Bechtel Corp.**, Box 58424, Vernon Branch, Los Angeles, Calif., CA **$4,750,000**. steel frame GENERATING STATION, Hy. 101 and Newland St., HUNTINGTON BEACH, CALIF. Southern California Edison Co., 601 W. 5 St., Los Angeles, Calif. CD 1/23.

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 26 wks 1956	Chge %
	$ millions		
Federal	$43.9	$899.9	+1
State and Municipal	217.2	3,269.8	+25
Total Public	261.2	4,169.7	+19
Total Private	154.7	7,193.6	+22
U. S. Total	$415.9	$11,363.3	+21
By Type of Work			
Waterworks	$6.8	$158.3	+23
Sewerage	10.0	308.1	+53
Bridges	17.2	318.5	+38
Highways	44.6	1,183.9	+11
Earthwork, Waterways	118.0	430.2	+56
Buildings:			
Public, Excl. Hosg.	46.3	1,014.2	+21
Public Housing	1.9	176.0	+27
Private Housing	67.2	3,019.8	−11
Commercial	21.1	961.2	+7
Industrial	51.9	2,837.0	+126
Unclassified	30.9	956.0	−4
U. S. Total	$415.9	$11,363.3	+21

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

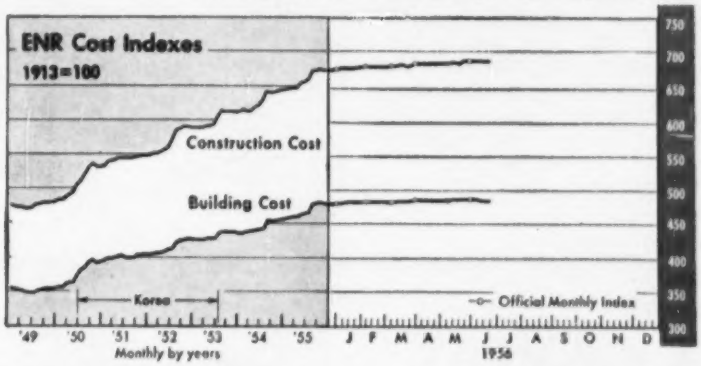
NEW CAPITAL FOR CONSTRUCTION

	Week of June 21	Cum. 25 wks 1956	Chge '55-'56 %
	$ millions		
Corporate Securities	$47.3	$2,130.6	+26
State and Municipal:			
All Except Housing	94.3	2,292.3	+10
Housing	20.6	41.2	−11
Federal Loans	13.7	78.5	+44
Federal Aid	805.0	905.0	+853
Total Nonfederal	$980.9	$5,447.7	+37
Federal Appropriations:			
In U. S.	$24.0	$82.6	+40
Outside U. S.	0.1	0.1	...
Total New Capital	$1,005.0	$5,530.4	+37

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of June 21, 1956	% Change from May 24, 1956	June 23, 1955
Construction Cost	693.13	+0.2	+5.1
Building Cost	488.39	−0.04	+4.5

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.845.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	May 31 1956 (millions)	Percent Change from last Month	Year
Total U. S. (ENR reported)	$99,938	+1.4	+18.2
By Ownership—			
Private	42,679	+2.4	+23.2
State & Municipal	44,306	+0.9	+17.2
Federal	12,953	0	+ 7.1
By Type of Work—			
Waterworks	2,071	+0.4	+15.0
Sewerage	3,026	+0.1	+ 2.7
Bridges	2,840	+0.5	+ 6.7
Highways	11,697	+1.7	+ 8.0
Earthwork, Waterways	11,299	−0.6	+19.3
Public Buildings	17,723	+1.4	+13.6
Industrial Buildings	16,000	+3.1	+29.7
Commercial Buildings	17,226	+2.5	+23.7
Unclassified, Private	9,453*	+0.9	+11.7
Unclassified, Public	8,602	−0.1	+30.7
By Regions—			
New England	5,446	+1.7	+ 9.1
Middle Atlantic	20,872	+1.4	+ 9.8
South	12,144	+2.8	+22.0
Middle West	17,697	+1.0	+21.7
West of the Mississippi	23,026	+1.0	+ 9.9
Far West	20,753	+1.2	+37.7

*Includes private bridges, $90 million.

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1956 May	5-Months (millions)	Percent Change from '55 May	Year-Cum.
Total U. S. (ENR reported)	$2,458	$12,461	+ 77	+ 32
By Ownership—				
Private	1,553	6,689	+140	+ 69
State & Municipal	794	4,993	+ 12	− 6
Federal	111	779	+275	+295
By Type of Work—				
Waterworks	24	167	− 74	− 28
Sewerage	47	203	+170	+ 28
Bridges	27	225	− 1	− 54
Highways	313	698	+ 36	− 74
Earthwork, Waterways	6	387	− 68	+ 28
Public Buildings	447	2,372	+ 63	+ 85
Industrial Buildings	786	3,171	+320	+105
Commercial: Mass Housing	339	1,681	+ 23	+ 40
Other Building	308	1,244	+115	+ 38
Unclassified, Private	120**	593***	+187	+ 96
Unclassified, Public	41	1,720	− 50	+402

**Includes private bridges, $10 million ***Includes private bridges, $13 million

Correction: ENR, June 14, 1956, p. 131. Building Cost Index should be 488.89 instead of 448.89

Gets More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back *at ground level* gets BIGGER LOADS with less spillage.

Keeps More

Heaped loads are cradled closer to the machine for greater stability and can be carried at lower level. Exclusive load shock-absorber cushions the load during travel, smooths out the ride, and permits faster movement with less spillage.

Delivers More

Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result — you *deliver* MORE. This new PAYLOADER is a more PRODUCTIVE machine which will handle more yardage at lower cost.

more yardage at lower cost...
New 2¼ yard PAYLOADER®

The new model HO is the finest four-wheel-drive tractor-shovel ever offered. All the *exclusive* features that increase yardage output enable it to handle many kinds of jobs never before practical with wheeled tractor-shovels.

It operates easier and faster, rides smoother, with or without a load, than anything near its size. It has *balanced* design and durability throughout to turn out big production day after day. If you want *proof* of its *productive capacity* and superior *performance*, ask your "PAYLOADER" Distributor for a demonstration.

Safety and Stability

The safest and most stable wheeled tractor-shovel ever built. Moving members cannot injure operator because of underslung boom arm design and positioning. With loads carried lower and closer to the machine, cushioned during travel, and with longer wheel-base, the utmost in stability is achieved.

More Production, Less Effort

Power-steering, power-brakes on all four wheels, power-shift with no clutching or stopping for range changes and good balance and riding qualities reduce operational fatigue — promote full production all day.

Digging Power

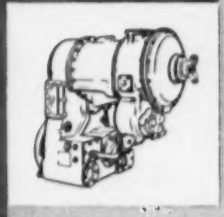
Pound for pound, the new model HO has more traction and digging power — for a wider range of ground conditions — than any wheeled tractor-shovel ever built.

PAYLOADER
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Torque-Proportioning Differentials *Reduce Wheel Slipping*

Another exclusive "PAYLOADER" feature which assures better traction under adverse conditions. If one wheel starts to spin, more power is delivered automatically to the other wheel.

Rugged planetary final drives in the wheel hubs, plus hypoid differential gearing keep torque low in axles, prolong life of drive-train parts as well as axles.



Complete Power-Shift Transmissions

"Complete" since ALL shifts can be made instantly and on-the-go, under full engine speed. There's NO STOPPING for a range-shift, there's no foot clutch pedal. With the forward-reverse control, the operator can "inch" the machine while maintaining full engine speed to provide maximum bucket lifting and dumping power. Torque converter drive cushions power-train shocks.

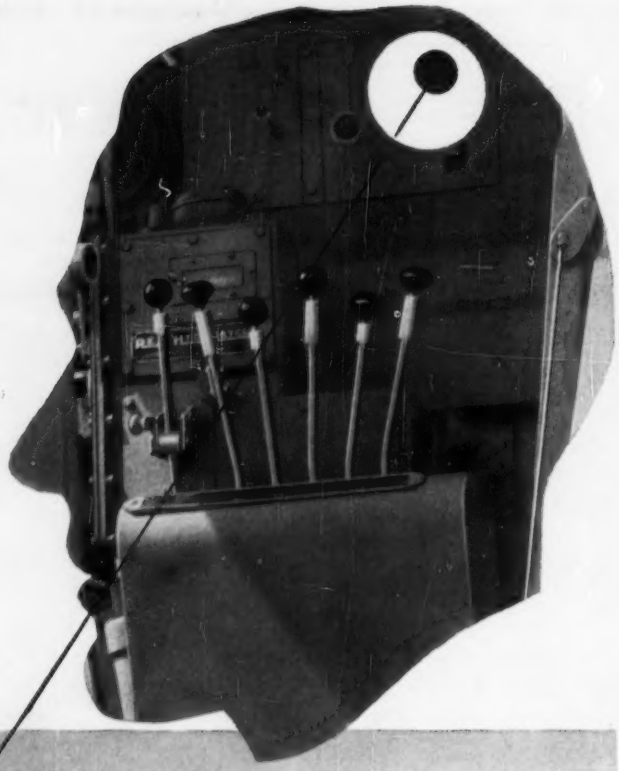
THE FRANK G. HOUGH CO.
772 Sunnyside Ave., Libertyville, Ill.

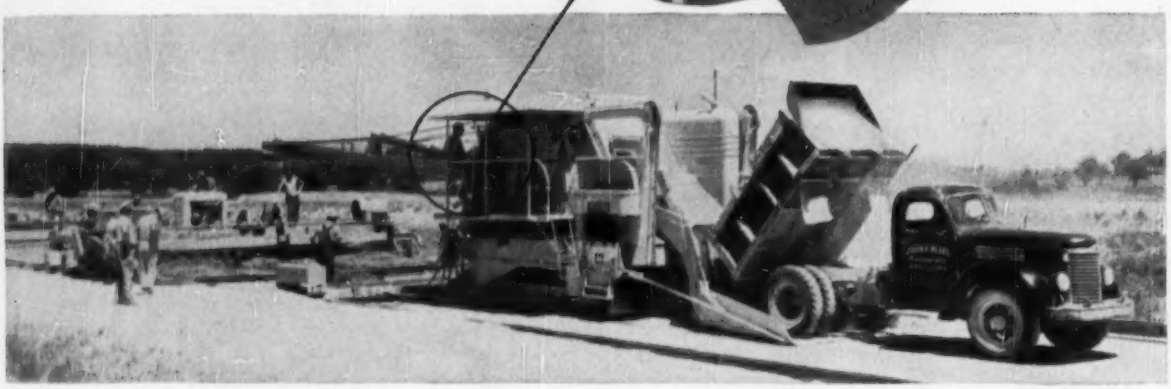
Send information on "PAYLOADER" tractor-shovels:

☐ model HO 2¼ cu. yd. heaped, 1¾ cu. yd. struck
☐ model HH 1¾ cu. yd. heaped, 1½ cu. yd. struck
☐ model HU 1 cu. yd. heaped, ¾ cu. yd. struck

Name_____
Title_____
Company_____
Street_____
City_____ State_____

Why you're always "yards" ahead with a REX® Paver

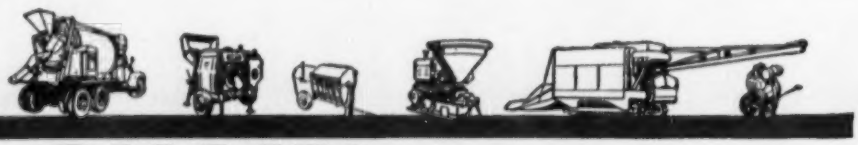




You'll finish "yards" ahead every day with a Rex... because the "hydraulic brain"—Hydrocycle Control—helps you pour more yards—faster! Hydrocycle saves you seconds every batch...you place more batches every day. That's dollars saved every day!

Hydrocycle takes over once the operator sets the batch meter...controls and operates the entire cycle. It eliminates the human element...cuts operator fatigue. There's no guesswork...no wasted seconds. The operator never has to leave his seat. He stays fresher...more relaxed...is able to give you the same high-speed operation at the end as well as at the start of the day. And he has far more time to perform the other paver functions—travel the bucket, swing the boom, spread the batch and move the paver. It's the big reason why Rex is the fastest paver in the business...makes more profit for you every day!

For all the facts, see your Rex Distributor or write CHAIN Belt Company, 4633 W. Greenfield Avenue, Milwaukee 1, Wis.



CONSTRUCTION REX MACHINERY

CHAIN BELT COMPANY

Outlays Climbing to a Record

Government raises estimates for construction put-in-place; 25% gain for industrial work offsets drop in housing category

After predicting last November that 1956 construction expenditures would total $44 billion, government experts last week took a second look at their crystal ball and raised their sights by another half-billion dollars.

With industrial and commercial building offsetting the decline in housing, private construction put-in-place will match last year's $31 billion, according to the Commerce and Labor Departments. But public works, sparked by the boom in road-building, will shoot ahead of 1955 by 9%, carrying the total for public works to the $13.5-billion mark.

Although construction expenditures will top record 1955 by some 4% if the government's experts are right, the most significant part of the revised forecast comes not in the total but in the individual categories.

• **Housing slides**—One of the biggest changes in the put-in-place forecast since last November is in the housing field. In common with many others, the Commerce and Labor Department experts predicted a downturn in private homebuilding this year—but they didn't realize how far down it would go.

With five-month's figures in hand, the government now estimates that about 1,150,000 housing units will be started this year. This compares with an earlier estimate of 1,200,000 for 1956 and a 1955 total of 1,310,000.

On a seasonally-adjusted basis, private starts during the first five months of this year were at an annual rate slightly under 1,150,000. The government apparently feels this rate will continue.

The forecast of $13.75 billion for housing expenditures this year is about 8% below 1955's record-breaking $15 billion. Although starts will be down more than construction outlays (12% vs 8%), higher construction costs and larger houses will make up some of the difference.

• **Bulls outweigh the bears**—The Commerce and Labor Department's revised estimate shows a shift in optimism. Although housing is down far more than had been originally expected, some of the other categories have been bullish.

Highways, private industrial plants, utilities and commercial building are going so strong that they will more than offset the drop in housing. All four of these categories are on their way to establish new put-in-place records.

The dollar volume of work put in place both for highways and for privately-owned utilities is expected to top the $5-billion level for the first time this year.

Private spending for new industrial plant expansion may reach the $3-billion mark (up 25% over 1955) and new commercial building outlays probably will exceed $3.4 billion, according to reports of the government experts.

All other types of construction are likely to show at least a slight gain in 1956 except hospital construction (both public and private), farm construction and public industrial building (principally government-built atomic power plants).

(*B&F continued on page 82*)

New Construction Activity in Continental United States 1955 and Outlook for 1956[1]

(Millions of dollars)

Type of construction	1955	1956	Percent Change 1956 from 1955
Total new construction	42,991	44,500	4
Private total	30,572	31,000	1
Residential (excluding farm)	16,595	15,500	−7
New dwelling units	1,990	13,750	−8
Additions and alterations	1,266	1,300	3
Nonhousekeeping	339	450	33
Nonresidential building	7,612	8,750	15
Industrial	2,399	3,000	25
Office buildings and warehouses	1,136	1,275	12
Stores, restaurants and garages	1,907	2,150	13
Other nonresidential building	2,170	2,325	7
Religious	734	750	2
Educational	492	550	12
Hospital and institutional	351	275	−22
Social and recreational	239	250	5
Miscellaneous	354	500	41
Farm construction	1,600	1,500	−6
Public utility	4,604	5,100	11
Railroad	374	450	20
Telephone and telegraph	805	975	21
Other public utility	3,425	3,675	7
Local transit	25	25	0
Pipeline	325	350	8
Electric light and power	1,800	1,900	6
Gas	1,275	1,400	10
All other private	161	150	−7
Public total	12,419	13,500	9
Residential	263	275	5
Nonresidential	4,277	4,025	−5
Industrial	721	425	−41
Educational	2,442	2,600	6
Hospital and institutional	331	275	−17
Other nonresidential building	733	725	−1
Military facilities	1,297	1,400	8
Highway	4,520	5,150	14
Sewage disposal	615	700	14
Water supply	470	600	28
Public service enterprises	279	500	79
Conservation and development	593	675	14
All other public	155	175	13

[1] Joint estimates of the Department of Commerce and the Department of Labor.

Structural Clay Products Stage Comeback

The structural clay products industry, which showed a steady decline throughout the depression and World War II, is roaring along the comeback trail at a faster pace than at any time since its heyday in the 1920's.

The brick and structural tile industry boosted its capacity 9.9% in 1955, to 12,047 million brick equivalents, according to a survey just completed by Robinson Newcomb, market analyst for the Structural Clay Products Institute.

Newcomb said that in the past two years, the structural clay products industry has expanded more proportionately than any other major materials producing group.

The end is not yet in sight. The brick and tile producers expect to hike their capacity another 4.2%—to 12,547 million brick equivalents—by January 1957.

"Expansion is the order of the day," Newcomb asserted. Capacity is being increased at the rate of more than 1% a month by the addition of new facilities and the improvement of existing facilities, he added.

• **Production is up 14%**—Addition of new capacity and better utilization of established plants resulted in a dramatic 14% increase in production of brick and structural tile units last year, Newcomb said. He added that this was the greatest production increase for any major structural building material during 1955.

While the structural clay products industry was jumping its output 14%, Newcomb said, lumber production was up 4.7% and cement, 9.4%.

• **The fluctuating market**—Newcomb expects 1956 production to top last year's total by 9% or more, carrying its output to record heights. It's a new charter in the history of a business that has witnessed a wildly-fluctuating market in the last three decades.

After achieving a peak of 13,900 million brick equivalents in 1925, the structural clay products industry's production declined steadily for nearly twenty years.

Then, starting with the postwar years, production of brick and structural tile began to climb—and it's been moving up ever since. In 1953, production reached 7,600 million brick equivalents. In 1954, production moved up another 5% and last year, it jumped 14%.

Predicting new construction records for 1956 and 1957, Newcomb sees the brick and structural tile market growing.

Brick, of course, accounts for the great bulk of the structural clay products output. Last year, brick production was estimated at 6,904 million brick equivalents; structural tile, 382 million; facing tile, 516 million; and other structural clay products, 433 million.

Hydro Bonds Sold

$166-million issue sold to finance Priest Rapids

Priest Rapids Dam will move quickly into the construction stage, after clearing its financial hurdle last week.

Revenue bonds totaling $166 million will be sold to a syndicate of 192 firms at an effective interest rate of 3.898% on a 49-year issue.

The syndicate's bid was offered to Grant County Public Utility District No. 2 (Washington) and a dozen utilities that will use the power generated at Priest Rapids. Halsey, Stuart & Co., Blyth & Co., B. J. Van Ingen & Co. and John Nuvee & Co. headed the syndicate.

While formal action must be taken to accept the bond bid, such action is expected to come within a few days. Grant County commissioners said that nine of the utilities involved already have approved the bid and the remaining three utility representatives at the bid opening agreed to recommend acceptance to their companies.

The public offering price for the $1,000 bonds will be $990. The syndicate purchase price is $962.

Acceptance of the bond bid means that formal award of a construction contract can be made to Merritt-Chapman & Scott Corp. as soon as the bonds are sold. The huge construction firm bid $91.8 million in March to build the 678,000 kw project.

Target date for start of construction is July 25. However, if the PUD runs into any unforeseeable snags, it can take advantage of a two-year extension of the completion deadline set in its federal license.

The Grant County Public Utility District will take 36.5% of the Priest Rapids power. The rest will be sold to utilities in Washington, Oregon, Idaho and Montana.

The participating utilities have options on similar amounts of power from the proposed Wanapum Dam, 20 mi upstream. This dam, also slated to be built by the Grant County PUD, would be started two years after construction begins on Priest Rapids.

Business Briefs . . .

• **Contractors' ranks growing**—The suspicion of many contractors that they are competing with more and more new firms has been confirmed. The Department of Commerce reported that 33,100 new contracting firms were listed in 1955. The 6.5% increase in number of firms raised the total number of companies listed as contractors to 475,000.

• **Tile imports set record**—Rising imports of tile are worrying some U.S. manufacturers. Roy E. Jordan, president of Mosaic Tile Co., called for higher import duties after disclosing that tile from Japan, Spain, Mexico, the United Kingdom and Italy accounted for 8.66% of U.S. sales last year. Imports have ballooned 763% in the past six years.

• **Koehring sales are up 50%**—Koehring Co., manufacturer of construction equipment, reported that its sales for the six months ended May 31 topped $21 million—a fat 50% increase over the figure for the same period in 1955.

• **Will it last?**—A leveling-off in business activity will affect the rate of expenditures for plant and equipment, 54% of the members of the National Association of Purchasing Agents said in response to a survey. But the other 46% were confident that plant and equipment expenditures will continue to go up. Most of the purchasing agents think business may slow down a little this quarter, then pick up through the fourth quarter.

• **Highway awards top $1-billion**—By mid-June, contract awards for highway construction, as reported by ENR, passed the $1-billion mark. Because the biggest roadbuilding months lie ahead, 1956 will set a new record for highway work by a wide margin. Every region stepped up its contract letting last month, except the New England states.

• **Cement expansion**—Permanante Cement Co., Oakland, Calif., plans a 1,400,000 bbl per year cement plant at Scholle, N. M. It's part of Permanente's $10-million construction program for New Mexico.

GULF PRODUCTS and FINE SERVICE

keep equipment rolling on Ohio Highway Relocation Project

Bruns Coal Company, Zanesville, Ohio, recently completed two adjoining Ohio State Highway Department projects involving some 1½ million cubic yards of earth and rock, in the relocation of State Routes 7 and 213, and U.S. Route 22. The photo here shows progress of the job in October 1955. The slope in the picture is 250 feet in height.

The Bruns people are mighty careful about controllable costs, particularly the kind attributable to excessive wear, below par equipment performance, and mechanical delays. That is one important reason why they select Gulf as their supplier of petroleum products on practically all of their jobs, like the one pictured here.

Like many other contractors, they have found that Gulf quality lubricants and fuels contribute to smooth equipment performance and low maintenance expense . . . and they appreciate Gulf's prompt delivery service and helpful engineering counsel.

Let us discuss with you how Gulf can help you on your next job. Or, send the coupon for your copy of our new brochure "Gulf and Your Business."

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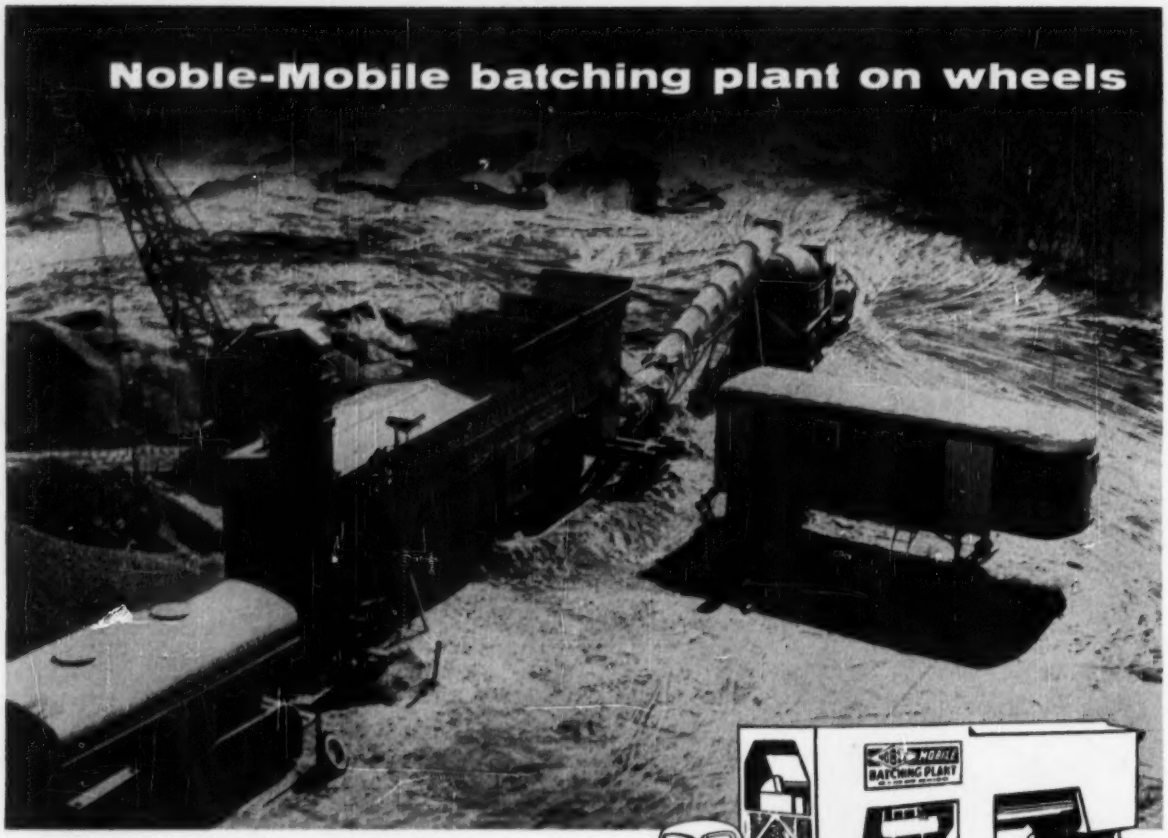
Noble-Mobile batching plant on wheels



lets you batch at site of fringe jobs and makes those jobs pay

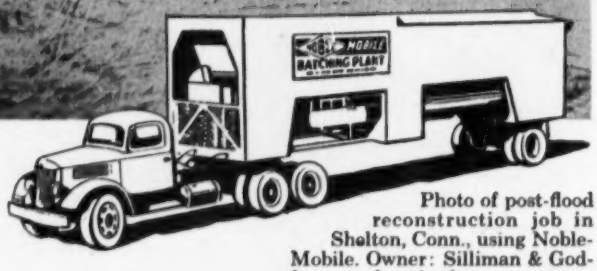
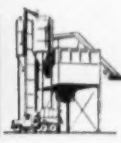


Photo of post-flood reconstruction job in Shelton, Conn., using Noble-Mobile. Owner: Silliman & Godfrey, ready mixed concrete.

Haul Noble-Mobile to job site like a semi-trailer • Set up in one day—no wiring, footings or crane time required • Charge aggregates with front end loader, crane or conveyor • Plant utilizes bulk cement—cement batched automatically • Excellent quality control • Maximum production from mixer trucks—short hauls, more yards per day • Production capacity 60 to 100 yards per hour. Covered by patents pending.

NOBLE BATCHING PLANTS

Portable, semi-portable or stationary plants designed and built by Noble Company · 1860 · 7th St., Oakland 20, Calif. TEmplebar 2-5785



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Steel talks put spotlight on . . .

The Long-Term Labor Contract

Collective bargaining in the steel industry focused attention again last week on use of long-term labor contracts, which now appear to be gaining wider acceptance in the construction industry.

U. S. Steel, Bethlehem and Republic had proposed a five-year, no-strike contract, coupled with fixed annual pay increases averaging 7½ cents an hour, an unemployment pay plan and increased welfare, pension, vacation and shift benefits. The offer won the backing of smaller producers but to the 650,000 workers who produce the bulk of the nation's steel, it was "too little and too long." Although many thought the union might accept a three-year contract with a 20-cent pay boost now, the week turned into talk of a national strike instead of a compromise.

In the meantime, members of the construction industry, where two-year agreements are now quite common, were quietly making headway with longer-term contracts as a means of bringing greater stability to their own labor costs and relations.

In Utah, the AGC signed its first four-year, state-wide contracts with two of the trades—laborers and cement finishers—providing fixed annual increases totaling 40 cents an hour, and had offered the carpenters a three-year contract pegged at 40 cents with a wage reopener for the final year. And in Buffalo, N. Y., the bricklayers became the first of the building trades to agree to a three-year contract, granting a 32½-cent pay boost spread over the first two years with the rate for the third year to be determined by the national average of the bricklayers' scale in 84 cities.

Other three-year contracts have been accepted by Gary and Hammond, Ind., laborers (who receive a package increase of 15 cents now with wage reopening the second and third years) and teamsters (who will receive fixed annual increases totaling 35 cents, plus increased welfare fund contributions). The AGC of Illinois has reached agreement with teamsters in 85 central and southern counties on a three-year contract granting pay boosts up to 50 cents an hour—but the old rates will prevail on jobs bid under the old scales.

Elsewhere, the issue has been pushed with still-doubtful results. In the record-breaking strike against the AGC, Gulf Coast Piping Contractors Association and Sabine Area Construction Committee in eastern Texas, for example, contractors have made an alternative offer of a three-year contract calling for hourly wage boosts of 10 cents now and 7½ cents for each of the last two years. And in California, a number of painting contractor associations in the San Francisco Bay Area have rejected a proposed three-year contract that would have given painters successive annual pay hikes of 18, 15 and 15 cents.

At the same time, other industries have continued the search for stabilization. Last week, for instance, labor and management in Honolulu brought the last of Hawaii's major industries under long-term contracts, when the maritime workers agreed to a five-year pact. Pineapple workers had earlier signed a three-year contract and sugar workers settled for a two-year period.

Higher Jobless Benefits Are Urged by Mich. Gov. Williams

Gov. G. Mennen Williams has recommended that Michigan unemployment compensation, now the highest in the nation, be further liberalized, making it possible for some of the unemployed to receive more than $85 a week.

Under Williams' proposal, jobless benefits would be "computed at 65% of the employee's average wage but not to exceed 66⅔% of the state's average wage." The duration period dependent, provided the total does not exceed 90% of the employee's average wage". The duration period would be extended from 26 to 39 weeks, although Williams would prefer to see no time limit at all.

The governor's recommendation, presented at the opening of the special session of the legislature on June 13, came in the face of rising unemployment accompanied by a drop in retail sales and a higher rate of evictions and repossessions—much of which stems from the current slump in the automobile industry.

Maximum benefits under present law are $54 a week. According to Gov. Williams, less than 4% of the unemployed are receiving the maximum benefit, the average payment is $34.

(*Labor continued on page 86*)

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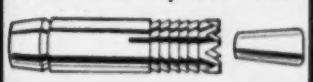

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. . . Labor

Homebuilding Gets a Lift From Nonunion Mennonites

Flint, Mich., hard-hit by tornado damage last month, is once again feeling the impact of the Mennonites—a religious sect—who arrived in force when the winds had spent their fury.

The Mennonites arrived without fanfare or publicity to rebuild the homes of those in need of help the most—the uninsured and the badly injured.

This is the second invasion of Flint by the religious sect. They came in 1953, after the twisters had ripped through a section of the city.

Over 50 of the sect are busy in Flint now, giving thousands of hours of labor without thought of payment. They will take no money, no assistance, no thanks.

Members have come from as far away as Pennsylvania. Others are from Indiana, Ohio and other neighboring states. They sleep in a Mennonite church, prepare their meals at a Methodist church and get the names of the stricken families from the Red Cross.

About five homes at a time are repaired. Usually only the outer walls and roof are put back in like-new condition, the interior being left for the home-owner to finish. But when an owner is hospitalized, or if the damaged property is owned by a widow, the Mennonites rebuild the entire home.

A union carpenter, queried on whether or not he or his union objected to the Mennonite farmers doing carpenter's work, scoffed at the question and said: "They belong to a bigger union than we do. When there is trouble like this I wish more of us felt like they do."

Labor Briefs . . .

• **Prevailing wages**—Employer contributions for retirement, pensions, holiday and vacation pay are not wages to construction workers for the purposes of prevailing wage determination under Indiana law, according to a ruling issued by the state's attorney general.

• **State mergers**—Virginia has joined the list of states completing AFL-CIO mergers on the state level, now making nine in all. Harold Boyd, a plumber, heads the new federation.

• **More flexibility**—Locals under Painters District Council 16 in California have agreed to a new area-wide system of operation for business agents, making it easier for members of one local to work in the jurisdiction of another.

OFFICIAL PROPOSALS

Bids: July 19, 1956

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania New Jersey Turnpike Authority New Brunswick, New Jersey

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission and the New Jersey Turnpike Authority, acting in conjunction as specified in the Proposal Documents, until 10:00 A.M., Eastern Daylight Saving Time, July 19, 1956, for Contract PN-7 in connection with the construction of the Delaware River Turnpike Bridge planned as a connection between the Pennsylvania and New Jersey Turnpikes. This Contract comprises the relocation of approximately 453 feet of Cherry Lane in the vicinity of Piers 15 and 16, including grading, paving, and drainage.

The principal items of work include:

Roadway Excavation, Earth
6" Crushed Aggregate Base Course Type B
2" Bituminous Surface Course ID-2
24" Reinforced Cement Concrete Pipe

All the work is located in Bucks County, Pennsylvania.

Proposals will be received at the Administration Building of the Pennsylvania Turnpike Commission, 11 North Fourth Street, Harrisburg, Pennsylvania, and immediately after the hour for closing be taken to the Public Utility Commission Hearing Room No. 1, North Office Building, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud.

Proposal Documents may be examined during office hours on or after July 3, 1956, at the office of the Pennsylvania Turnpike Commission or at the office of the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey. Proposal Documents will be furnished upon payment of Twenty Dollars ($20.00) for each set. No refund will be made.

PENNSYLVANIA TURNPIKE COMMISSION
John F. Byrne, Secretary-Treasurer
NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman
June 28, 1956

Bids: July 5, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A. M., Eastern Daylight Saving Time, on July 5, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 1, SECTIONS 1 AND 2, ALBANY TO CLIFTON PARK, TOWNSHIPS OF GUILDERLAND, COLONIE, HALFMOON, CLIFTON PARK, ALBANY AND SARATOGA COUNTIES, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-90.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. G. L. Nickerson, District Engineer, 353 Broadway, Albany, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $46,800.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,340.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: July 5, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law, sealed proposals will be received until 10:30 A.M., D.S.T., on July 5, 1956 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

CONTRACT M 56-2 FOR CLEANING AND PAINTING BRIDGES OVER THE ERIE AND OSWEGO CANALS IN OSWEGO, ONONDAGA AND WAYNE COUNTIES, NEW YORK

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. William Robinson, District Engineer, 301 E. Water Street, Syracuse, New York
(c) Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
The Engineer's estimate of cost for this work is $17,100.00.
Each proposal must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by a draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $900.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law and Canal Law, as set forth in "Instructions to Bidders".
The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: July 24, 1956

Contract No. 6

ADVERTISEMENT
NOTICE TO CONTRACTORS

Notice is hereby given that sealed bids or proposals in sealed plain wrapper bearing the appropriate identification "Bid for Water Treatment Plant Equipment, Contract No. 6", will be received by the Board of Water Commissioners at its office in the Town Hall, Town of Bethlehem, Delmar, New York at 7:30 P.M. Eastern Daylight Saving Time, on the 24th of July, 1956, and then will be publicly opened and read aloud at a meeting of said Board, to be held at such time and place.
The work includes furnishing and installing equipment for a 1.5 MGD filter plant including meters, controllers, piping, valves, operating tables, surface wash system, filter underdrains, clarifiers, pumping equipment, chlorinating equipment, and other appurtenant work.
Copies of the plans and specifications may be examined at the office of the Town Clerk of the Town of Bethlehem, New York, 393 Delaware Avenue, Delmar, New York, or at the office of the Engineers, Benjamin L. Smith & Associates, 11 North Pearl Street, Albany, New York; copies thereof may be purchased from the Board and/or Engineers upon payment of Twenty Dollars ($20.00) for each set of plans and specifications.
Proposals must be submitted on the blank forms provided and in a manner designated therein. Each proposal must be accompanied by a Bid Bond or certified check in an amount equal to Five Per Cent (5%) of the Total bid. The Bid Bonds or Certified Checks of all but the three lowest bidders will be returned within ten days after the opening of bids, while the remaining bonds or checks will be returned as soon as a contract has been executed. The Bid Bond or Certified Check of the successful bidder will be retained to pay any loss of damage to Water District No. 1 and/or Town of Bethlehem, in the event said successful bidder shall refuse or neglect to enter into a contract in accordance with this proposal. Acceptance of the bid will be contingent upon the fulfillment of this requirement by each bidder.
The Board of Water Commissioners reserves the right to consider bids for a period of Forty-Five Days after their opening, and the right is reserved to reject all bids.

BOARD OF WATER COMMISSIONERS, WATER DISTRICT NO. 1
TOWN OF BETHLEHEM, NEW YORK
BY: Harold C. Barkhuff, Chairman

Bids: July 17, 1956

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
CHANNEL IMPROVEMENTS AT IROQUOIS PLANT

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario, and clearly marked
"TENDER FOR ST. LAWRENCE POWER PROJECT
CHANNEL IMPROVEMENTS AT IROQUOIS POINT"
will be received up to 4.30 o'clock p.m., Eastern Daylight Saving Time, on
TUESDAY, JULY 17, 1956.

The work to be done will comprise the clearing, dredging and excavation, disposal, salvage, and distribution of materials, supply and placing of crushed rock, gravel and sand, and other incidental work.
The work is to commence within fifteen (15) calendar days after notice of the award of the contract and is to be completed by July 31, 1958.
Copies of the tendering documents may be obtained on or after Monday, June 18, 1956, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of twenty-five dollars ($25.00) for each set. This charge will not be refunded.
Tendering documents may be inspected at the above address and at the offices of the following: the Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.
Each tender must be accompanied by a certified cheque drawn on a Canadian chartered bank for a sum calculated as follows: On tenders up to $500,000, the sum shall be 10 per cent of the total amount of the tender; on tenders over $500,000, the sum shall be 10 per cent of the first $500,000 and 5 per cent of the excess over $500,000. Provisions for the return of the cheques appear in the tendering documents.
The successful tenderer will be required to furnish a performance bond in the form approved by the Commission and issued by a bonding company licensed as such in the Province of Ontario and acceptable to the Commission for one hundred per cent (100%) of the total amount of the contract.
The lowest or any tender will not necessarily be accepted.

E. B. EASSON
SECRETARY

Bids: July 5, 1956

New York State Roadwork

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A. M., Eastern Daylight Saving Time, on July 5, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON ROUTE 17 EXPRESSWAY, DAMASCUS TO WEST WINDSOR, TOWNSHIP OF WINDSOR, BROOME COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. 8M-89

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Joseph C. Federick, District Engineer, 71 Frederick Street, Binghamton, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
The Engineer's estimate of cost for this work is $36,300.00.
Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,820.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."
The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: July 5, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law, sealed proposals will be received until 10:30 A.M., D.S.T., on July 5, 1956 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

CONTRACT M 56-1 FOR CLEANING AND PAINTING BRIDGES OVER THE ERIE CANAL AND MOHAWK RIVERS IN MONTGOMERY, HERKIMER AND ONEIDA COUNTIES, NEW YORK.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Lacy Ketchum, District Engineer, 109 N. Genesee St., Utica 1, New York.
(c) Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
The Engineer's estimate of cost for this work is $17,000.00.
Each proposal must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by a draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $900.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law and Canal Law, as set forth in "Instructions to Bidders".
The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4717) will be received at Denver, Colorado, until July 31, 1956, for furnishing one vertical-shaft, double volute, centrifugal-type pump, capacity 75 cfs under 92-foot head and one vertical-shaft, 2,300-volt, three phase, 60-cycle, synchronous motor, 1,250 hp rating at either 360 rpm or 400 rpm for "C" Line Canal Pumping Plant Extension, Boise Project, Idaho. Delivery is desired within 240 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Bids: August 15, 1956

Republic of Liberia

DEPARTMENT OF PUBLIC WORKS AND UTILITIES
DIVISION OF HIGHWAYS

MONROVIA

STANDARD GOVERNMENT FORM OF INVITATION FOR BIDS
FORM NO. 20

SEALED BIDS, in single copy only, subject to the conditions contained herein, will be received until 11 o'clock A.M., Monrovia time, on the 15th day of August 1956, and then publicly opened at that time, at the office of the Secretary of the Department of Public Works and Utilities, for furnishing the materials and performing the work for constructing the Liberia, Gbarnga—Kailahun Projects SH 1-B(2), SH 1-C, SH 1-D and SH 1-E. Telegraphic bids will not be accepted. Bids received after the above time and date will not be considered. The combined length of the Projects is approximately 144.6 miles, and the items of work are approximately as follows:

Project SH 1-B(2)

Item No.	Item	Quantity	Unit
20(1)	Clearing and Grubbing	5	Acres
24(1)	Unclassified Excavation	22,000	Cu. Yds.
25(1)	Unclassified Excavation for Structures	325	Cu. Yds.
27(2)	Overhaul on Uncl. Excavation (1000' F.H.)	10,000	Sta. Yds.
28(2)	Overhaul on Select Borrow Surf. Crs. (1000' F.H.)	5,000	Cu. Yd. Mi.
30(1)	Foundation Fill	150	Cu. Yds.
37(1)	Furrow Ditches	1,000	Lin. Ft.
100(1)	Select Borrow Surface Course (Laterite)	1,600	Cu. Yds.
206(1)	Class "A" Concrete	845	Cu. Yds.
206(2)	Class "B" Concrete	60	Cu. Yds.
206A(5)	Class "Y" Concrete	16	Cu. Yds.
207(1)	Reinforcing Steel	167,000	Lbs.
220(1)	Structural Steel	213,000	Lbs.
249(1)	Concrete Block Masonry Headwalls	5	Cu. Yds.
250(3)	24" Standard Str. Reinf. Concrete Pipe	42	Lin. Ft.
250(4)	30" Standard Str. Reinf. Concrete Pipe	60	Lin. Ft.
250(5)	36" Standard Str. Reinf. Concrete Pipe	60	Lin. Ft.
255A(3)	24" Bituminous coated corr. sheet metal Culvert Pipe, Type 2, Nestable	42	Lin. Ft.
255A(4)	30" Bituminous coated corr. sheet metal Culvert Pipe, Type 2, Nestable	60	Lin. Ft.
255A(5)	36" Bituminous coated corr. sheet metal Culvert Pipe, Type 2, Nestable	60	Lin. Ft.
310(1)	Loose Rip Rap	800	Cu. Yds.
Extra Work: Stone Ditch checks, planting grass, etc		Lump Sum	

Project SH 1-C

20(1)	Clearing and Grubbing	385	Acres
24(1)	Unclassified Excavation	940,000	Cu. Yds.
25(1)	Unclassified Excavation for Structures	8,500	Cu. Yds.
27(2)	Overhaul on Uncl. Excavation (1000' F.H.)	263,000	Sta. Yds.
28(2)	Overhaul on Select Borr. Surf. Crs. (1000' F.H.)	400,000	Cu. Yds. Mi.
30(1)	Foundation Fill	3,000	Cu. Yds.
37(1)	Furrow Ditches	62,500	Lin. Ft.
100(1)	Select Borrow Surface Course (Laterite)	143,000	Cu. Yds.
206(1)	Class "A" Concrete	4,500	Cu. Yds.
206(2)	Class "B" Concrete	90	Cu. Yds.
206A(5)	Class "Y" Concrete	10	Cu. Yds.
207(1)	Reinforcing Steel	510,000	Lbs.
249(1)	Concrete Block Masonry Headwalls	600	Cu. Yds.
250(1)	15" Standard Reinf. Conc. Pipe Culvert	480	Lin. Ft.
250(2)	18" Standard Reinf. Conc. Pipe Culvert	600	Lin. Ft.
250(3)	24" Standard Reinf. Conc. Pipe Culvert	1,104	Lin. Ft.
250(4)	30" Standard Reinf. Conc. Pipe Culvert	5,721	Lin. Ft.
250(5)	36" Standard Reinf. Conc. Pipe Culvert	2,649	Lin. Ft.
250(6)	48" Standard Reinf. Conc. Pipe Culvert	3,876	Lin. Ft.
250(7)	60" Standard Reinf. Conc. Pipe Culvert	162	Lin. Ft.
255A(1)	15" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	480	Lin. Ft.
255A(2)	18" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	600	Lin. Ft.
255A(3)	24" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	1,104	Lin. Ft.
255A(4)	30" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	5,721	Lin. Ft.
255A(5)	36" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	2,649	Lin. Ft.
255A(6)	48" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	3,876	Lin. Ft.
255A(7)	60" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	162	Lin. Ft.
310(1)	"Loose Rip Rap"	700	Cu. Yds.
	Extra Work: Stone Ditch checks,-Planting grass on Embankment Slopes, etc	Lump Sum	

Project SH 1-D

20(1)	Clearing and Grubbing	400	Acres
24(1)	Unclassified Excavation	1,110,000	Cu. Yds.
25(1)	Unclassified Excavation for Structures	9,000	Cu. Yds.
27(2)	Overhaul on Uncl. Excav. (1000' F.H.)	260,000	Sta. Yds.
28(2)	Overhaul on Select Borrow Surf. Crs (1000' F.H.)	400,000	Cu. Yd. Mi.
30(1)	Foundation Fill	3,000	Cu. Yds.
37(1)	Furrow Ditches	62,000	Lin. Ft.
100(1)	Select Borrow Surface Course	143,000	Cu. Yds.
206(1)	Class "A" Concrete	4,050	Cu. Yds.
206(2)	Class "B" Concrete	200	Cu. Yds.
206A(5)	Class "Y" Concrete	35	Cu. Yds.
207(1)	Reinforcing Steel	566,000	Lbs.
249(1)	Concrete Block Masonry Headwalls	525	Cu. Yds.
250(1)	15" Standard Str. Reinf. Conc. Culvert Pipe	300	Lin. Ft.
250(2)	18" Standard Str. Reinf. Conc. Culvert Pipe	600	Lin. Ft.
250(3)	24" Standard Str. Reinf. Conc. Culvert Pipe	1,080	Lin. Ft.
250(4)	30" Standard Str. Reinf. Conc. Culvert Pipe	3,330	Lin. Ft.
250(5)	36" Standard Str. Reinf. Conc. Culvert Pipe	2,660	Lin. Ft.
250(6)	48" Standard Str. Reinf. Conc. Culvert Pipe	4,509	Lin. Ft.
255A(1)	15" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	300	Lin. Ft.
255A(2)	18" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	600	Lin. Ft.
255A(3)	24" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	1,080	Lin. Ft.
255A(4)	30" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	3,300	Lin. Ft.
255A(5)	36" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	2,660	Lin. Ft.
255A(6)	48" Bituminous coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	4,500	Lin. Ft.
310(1)	"Loose Rip Rap"	900	Cu. Yds.
	Extra Work: Stone Ditch checks, Planting grass on Embankment Slopes, etc	Lump Sum	
	Special Provisions: Construct Ferry at Loffa River	Lump Sum	

Project SH 1-E

20(1)	Clearing and Grubbing	420	Acres
24(1)	Unclassified Excavation	1,200,000	Cu. Yds.
25(1)	Unclassified Excavation for Structures	9,500	Cu. Yds.
27(2)	Overhaul on Uncl. Excav. (1000' Free Haul)	263,000	Sta. Yds.
28(2)	Overhaul on Select Bor. Surf. Crs. (1000' F.H.)	400,000	Cu. Yd. Mi.
30(1)	Foundation Fill	3,500	Cu. Yds.
37(1)	Furrow Ditches	62,500	Lin. Ft.
100(1)	Select Borrow Surface Course	150,000	Cu. Yds.
206(1)	Class "A" Concrete	3,100	Cu. Yds.
206(2)	Class "B" Concrete	200	Cu. Yds.
206A(5)	Class "Y" Concrete	35	Cu. Yds.
207(1)	Reinforcing Steel	450,000	Lbs.
249(1)	Concrete Block Masonry Headwalls	600	Cu. Yds.
250(1)	15" Standard Str. Reinf. Conc. Pipe Culvert	480	Lin. Ft.
250(2)	18" Standard Str. Reinf. Conc. Pipe Culvert	600	Lin. Ft.
250(3)	24" Standard Str. Reinf. Conc. Pipe Culvert	1,100	Lin. Ft.
250(4)	30" Standard Str. Reinf. Conc. Pipe Culvert	5,175	Lin. Ft.
250(5)	36" Standard Str. Reinf. Conc. Pipe Culvert	2,800	Lin. Ft.
250(6)	48" Standard Str. Reinf. Conc. Pipe Culvert	4,600	Lin. Ft.
250(7)	60" Standard Str. Reinf. Conc. Pipe Culvert	150	Lin. Ft.
255A(1)	15" Bituminous Coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	480	Lin. Ft.
255A(2)	18" Bituminous Coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	600	Lin. Ft.
255A(3)	24" Bituminous Coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	1,100	Lin. Ft.
255A(4)	30" Bituminous Coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	5,175	Lin. Ft.
255A(5)	36" Bituminous Coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	2,800	Lin. Ft.
255A(6)	48" Bituminous Coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	4,600	Lin. Ft.
255A(7)	60" Bituminous Coated Corr. Sheet Metal Culvert Pipe, Type 2, Nestable	150	Lin. Ft.
310(1)	Loose Rip Rap	800	Cu. Yds.
	Extra Work: Stone Ditch checks, Planting grass on Embankment Slopes, etc	Lump Sum	

The Government will permit the contractor to import duty free, any supplies or materials incorporated in the work, or equipment used on the work. The contractor will furnish all equipment necessary for construction of the work and all materials and supplies incorporated in the work unless specific mention is made to the contrary in the Special Provisions or Invitation for Bids. Supplies or materials not of Liberia or United States origin or manufacture shall not be used on this project without the written consent of the Secretary of the Department of Public Works and Utilities.

Preference of employment in all categories shall be given to qualified Liberian and United States citizens, but only Liberian citizens may be employed as Unskilled Labor, except upon written permission of the Secretary of the Department of Public Works and Utilities. Only Bids from qualified Liberian or United States firms or entities presently incorporated in, or licensed to operate in, either country will be considered. Bidders' attention is called to Article 13 "Officials Not To Benefit"; Article 17, "Domestic Preference"; aid Article 22, "Preference of Employment", of the Contract and Proposal.

Competency of Bidders shall be indicated by the submission at the earliest possible date prior to submission of bids of the Attested Statements and Questionnaires prescribed in Article 2.6 of "Specifications FP-41". These forms will be furnished with the Proposals.

The plans, specifications, special provisions, and Pre-qualification Questionaires may be obtained at the Department of Public Works and Utilities, Office of the Chief Engineer, Monrovia, R. L., and will also be available for examination at the Liberian Embassy and the Bureau of Public Roads in Washington, D. C. U. S. A. When copies of plans and specifications are requested, a deposit of $100.00 (cash or certified check) will be required to insure their return. If these are not returned with in (15) fifteen days after opening of bids the deposit will be forfeited to the Government. Certified checks should be made upon a Monrovia Bank or reputable firm approved by the Secretary of the Department of Public Works and Utilities, and payable to the Bureau of Revenues, Republic of Liberia.

Performance of the contract shall begin within (60) sixty Calendar days after the date of the Notice to Proceed and the contract shall be completed within 720 calendar days, subject to such extensions as may be authorized by the terms of Article 8.6 of "Specifications FP-41". Contract time will begin (60) sixty days after the Notice to Proceed and will run concurrently on Projects SH 1-B(2), SH 1-C, and SH 1-D.

Notice to Proceed on Project SH 1-E shall be given within (60) sixty days of the estimated time of completion of grading plans, and contract time will begin (60) sixty days after the Notice to Proceed. Contract time for Project SH 1-E shall be 360 calendar days, subject to such extensions as may be authorized by the terms of Article 8.6 of "Specifications FP-41".

A Bid Bond, or cash, or negotiable check payable to the Republic of Liberia, in the amount of 5% of the amount of the bid must accompany the Bid, otherwise the Bid will not be considered. This security will be returned upon award to the contractor. Performance and payment Bonds, each in the amount of 20% of the Bid Amount will be required.

Liquidated damages for delay will be as set forth in Article 8.7 of "Specifications FP-41," as modified by the Special Provisions. Partial payments will be made as set forth in Article 9.6 of "Specifications FP-41." No partial payments will be made, however, when the amount due is less than $500.

The right is reserved, as the interests of the Government may require, to reject any and all bids, and to waive any informality in bids received.

Envelopes containing bids must be sealed, marked and addressed as follows:

BID FOR CONSTRUCTION
Liberia, Saint Paul River-Kailahun, Projects SH 1-B(2), SH 1-C SH 1-D and SH 1-E.

The Honorable
The Secretary of Public Works and Utilities
Department of Public Works and Utilities
Monrovia, Liberia.

NOTE: See copies of Standard Government Instructions to Bidders, Standard Government Form of Contract, which are part of this Proposal and Contract.
In the interest of uniformity, bidders are required to complete the forms provided in the Proposal and Contract, or exact copies of them when submitting bids. These are: Bid Schedule; Bid (Construction Contract); Contract (Construction); Standard Government Form of Bid; Bid Bond (Construction or Supply); Performance Bond (Construction or Supply); and Payment Bond (Construction).

OFFICIAL PROPOSALS

Bids: July 9, 1956

Pennsylvania Turnpike Commission
Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 2:30 p. m., Eastern Daylight Saving Time, the 9th day of July 1956, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract:

For the slushing of mine areas of the Turnpike Section 37-K and 37-L part of the Northeastern Extension of the Pennsylvania Turnpike in Lackawanna County, Commonwealth of Pennsylvania. The areas are situated as follows:

Beginning at a point approximately at Station 219+15 in Section 37-K; thence in a Northerly direction to a point approximately at Station 221+60 in Section 37-K.

Beginning at a point approximately at Station 226+35 in Section 37-K; thence in a northerly direction to a point approximately at Station 227+20, Section 37-K.

Beginning at a point approximately at Station 429+70 in Section 37-L; thence in a northerly direction to a point approximately at Station 434+00 in Section 37-L.

The approximate quantities of the principal items are as follows:

Station 219+15 to Station 221+60—14,900 cubic yards

Station 226+35 to Station 227+20—3,000 cubic yards

Station 429+70 to Station 434+00—5,250 cubic yards

Contract documents and specifications for the slushing in the areas specified above may be purchased from the Pennsylvania Turnpike Commission, 11 North Fourth Street, Harrisburg, Pennsylvania, for the sum of ten ($10.00) dollars for each set. Plans, specifications and other contract documents will be available on 21 June 1956. No refund will be made for contract documents and specifications returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P. O. money order to the Pennsylvania Turnpike Commission and must accompany requests for contract documents and specifications.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
John F. Byrne
Secretary and Treasurer

Harrisburg, Pennsylvania
June 19, 1956

Bids: July 3, 1956

Pennsylvania Turnpike Commission
Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:15 a.m., Eastern Daylight Saving Time, the 3rd day of July 1956, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room #1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contracts:

For the undersealing of portland cement concrete pavements with a hot liquid bituminous material conforming with the specifications as to quality and method of construction.

Contract No. 191. From milepost 177.0 to milepost 186.2, a total distance of 9.2 miles.

Contract No. 192. From milepost 210.0 to milepost 226.0, a total distance of 16.0 miles.

Copies of specifications and Contract Documents are on file and open to public inspection on 19 June 1956, at the office of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania, and at the Everett Maintenance Building, Everett, Pennsylvania. Specifications and other contract documents will not be available before this date for mailing to prospective bidders.

Contract documents may be obtained from the Commission upon payment of ten ($10.00) dollars for each set. Copies of the Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five ($5.00) per copy. No refund will be made for contract documents returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P.O. money order to the Pennsylvania Turnpike Commission and must accompany requests for specifications and contract documents.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
John F. Byrne
Secretary and Treasurer

Harrisburg, Pennsylvania
15 June 1956

Bids: July 19, 1956

Town of Colonie, New York

ADVERTISEMENT
NOTICE TO CONTRACTORS
FILTER PLANT EXTENSION
COAGULATING AND SETTLING BASINS
AND
BOOSTER PUMP STATION

Sealed bids will be received by the Town Clerk, Harold R. McCabe, of the Town of Colonie, New York on the 19th day of July 1956, until 2:30 P.M. Daylight Saving Time, at the office of the Town Clerk in the Town Hall, Newtonville, New York, for furnishing labor, materials and equipment and constructing an extension to the Filter Plant, coagulating, settling basins, and a Booster Pump Station together with furnishing miscellaneous material and equipment for the project.

The Filter Plant coagulating and settling basins have been divided into the following sections, contractors may bid on any or all sections.

Section A—General Construction on Extension of Filter Plant Building, Concrete Filter Tubs, Grading, Walks, Roads, etc.

Section B—Filter Plant Equipment consisting of filter bottoms, sand, gravel, pipe gallery, piping, valves, specials, standards, instruments and miscellaneous equipment.

Section C—Coagulators, settling basins, piping and equipment. Aerator and Equipment. Improvements to present coagulator.

Section D—Plumbing Work.
Section E—Heating Work.
Section F—Electrical Work.
Section G—Outside Piping at Filter Plant.

The Booster Pump Station has been divided into four sections as follows:

Section 1—Construction of Building, installation of piping, valves and appurtenances and the furnishing and installing of appurtenances called for by plans or specifications.

Section 2—Furnishing 4,400 G.P.M. pumps, with motors and appurtenances called for by the plans or specifications.

Section 3—Furnishing pipe and fittings, called for by plans or specifications.

Section 4—Furnishing valves and appurtenances called for by plans or specifications.

The Information for Bidders, Forms of Bid, Forms of Contract, Plans, Specifications and Performance Bonds may be examined at the office of the Town Clerk, Town Hall, Newtonville, New York, and at the office of Kels & Holroyd, 257 Broadway, Troy, New York. Copies thereof may be obtained at the office of Kels & Holroyd, or from the Town Clerk, upon payment of $25.00 for each set. Any bidder upon returning such set at the time of bidding and in good condition, will be refunded his payment, and any non-bidder upon so returning such set within 30 days of the date of receiving bids, will be refunded $20.00.

The Town Board of the Town of Colonie, New York, reserves the right to waive any informalities in or to reject any or all bids.

A certified check made payable to the order of the Town of Colonie, in the amount of Five Per Centum (5%) of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will, within five (5) days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so, he shall forfeit the deposit as liquidated damages and acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder.

The successful bidder will be required to furnish a performance bond satisfactory to the Town of Colonie, New York, in the amount of the contract and having as surety thereon, such surety company or companies as are acceptable to the Town of Colonie, New York.

No bidder may withdraw his bid within 30 days after the date set for the opening thereof. Any bid may be with drawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

HAROLD R. McCABE, TOWN CLERK
Kels & Holroyd
Consulting Engineers
Troy, New York
Dated: June 18, 1956

U. S. Government

GOVT. OF DIST. OF COL., DEPT. OF HIGHWAYS, June 19, 1956. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D. C., until 2 PM, EDT, July 19, 1956, and then publicly opened and read for constr. a reinf. concr. Bridge on N. Cap. St. over Irving St. Extended (Fed. Aid Project F-55(2), incl. approx. 3,783 cu. yds. concr.; 669,000 lbs. reinf. steel; 41,000 cu. yds. excavation; 16,342 lin. ft. treated piling, 533 lin. ft. aluminum railings; and 3,910 sq. ft. stone facing. Proposal forms, plans and specns. obtainable from Supervisor, Contr. & Bond Section, Procurement Office, D. C., Rm. 406, 499 Penn. Ave. N.W., upon deposit of a certied check for $20.00 per set, payable to Collector of Taxes, D. C. (Tel. NA 8-6000, Ext. 2378).

Department of Commerce, Bureau of Public Roads, June 14, 1956. SEALED BIDS will be received at the office of the Bureau of Public Roads, First National Bank Building, Florence, Alabama, until 10:00 a.m., C.S.T., JULY 13, 1956, for the construction of Project 3G1, Natchez Trace Parkway, Chickasaw, Clay and Webster Counties, Mississippi. 8.223 miles Grading, Draining, Structures, Gravel Base Course, and other work from Woodland-Montpelier Road to Line Creek Canal. The approximate quantities of the more important items are as follows: 797,300 cu. yd. Excavation and Borrow, 42,500 cu. yd. Gravel, 1,525 cu. yd. Concrete, and 5,000 units of Seeding. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the address given above, or Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia. H. J. Spelman, Division Engineer.

General Services Administration, Public Buildings Service: Sealed Bids For Cleaning and Painting 8" Steel Pipe, etc. at the National Guard Armory, Western Avenue, Morris Township, N. J. will be received in triplicate until 2:00 P.M., EDST, on July 9, 1956 and then publicly opened in the Bid Room of the Business Service Center, 250 Hudson Street, New York 13, New York. Specifications, etc., may be obtained from the Business Service Center; from the Custodian of the Building.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4694) will be received at Fargo, North Dakota, until August 2, 1956, for furnishing labor and materials for Grand Forks Substation, Missouri River Basin Project, North Dakota. Location near Grand Forks, North Dakota. Principal items are 28,760 cu. yds. excavation; 360 cu. yds. concrete; 80,000 pounds furnishing and erecting steel structures; constructing service building; and other work. Completion time 360 days. For particulars, address Bureau of Reclamation, P. O. Box 2553, Billings, Montana; P. O. Box 1993, Fargo, North Dakota; or Building 52, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: July 5, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law, sealed proposals will be received until 10:30 A.M. D.S.T. on July 5, 1956 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

CONTRACT M 56-3 FOR CLEANING AND PAINTING BRIDGES OVER THE ERIE CANAL IN MONROE AND ORLEANS COUNTIES, NEW YORK

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New
(b) Mr. B. F. Perry, Acting District Engineer, Barge Canal Terminal, Rochester, New York.
York.
(c) Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
The Engineer's estimate of cost for this work is $21,500.00.
Each proposal must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by a draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $1,-100.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law and Canal Law, as set forth in "Instructions to Bidders".
The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF
PUBLIC WORKS

Bids: July 5, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law, sealed proposals will be received until 10:30 A.M., D.S.T., on July 5, 1956 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

CONTRACT M 56-4 FOR CLEANING AND PAINTING BRIDGES OVER THE ERIE CANAL IN NIAGARA COUNTY, NEW YORK

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. E.G.H. Youngmann, District Engineer, 65 Court St., Buffalo 2, New York
(c) Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
The Engineer's estimate of cost for this work is $41,500.00.
Each proposal must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by a draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance", in the amount of $2,-100.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law and Canal Law, as set forth in "Instructions to Bidders".
The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF
PUBLIC WORKS

EMPLOYMENT OPPORTUNITIES

FIELD SERVICE ENGINEERS CONSTRUCTION & MINING EQUIPMENT

Leading equipment manufacturer needs Field Service engineers to supervise erection and maintenance of electric shovels. Electrical engineering degree desirable but not necessary if applicant has suitable background and experience. 30-40 age preferred. Write, giving full particulars to

ASST. PERSONNEL DIR.
HARNISCHFEGER CORPORATION
4400 W. NATIONAL AVE.
MILWAUKEE 46, WISCONSIN

REPLIES (Box No.): Address to office nearest you c/o this publication, Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Mechanical and Piping Erection Superintendent for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1719, Engineering News-Record.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer systems; also, architects for preparation of plans for general building work. State experience, age, salary required, when can report, and give references. Reply P-1800, Engineering News-Record.

Designers & Draftsmen—Structural, electrical, piping air cond., & arch. Industrial buildings and power plants. Marbarry, 120 Greenwich St., N.Y.C. RE-2-3749.

Instructor—To teach undergraduate courses in applied mechanics. Opportunity to work on graduate degree in any engineering department. Salary depends on qualifications of applicant. Department of Applied Mechanics, University of Kansas, Lawrence, Kansas.

Assistant Professor and Instructor in Civil Engineering. Assistant Professor to take charge of surveying—highway course sequence and surveying camp. Eastern metropolitan college, start September 1, 1956. Reply P-2004, Engineering News-Record.

College Teaching position open to teach civil engineering and mechanics courses other than structural. Rank and salary based on applicant's qualifications. Write: Head, Civil Engineering Department, Clarkson College of Technology, Potsdam, New York.

Wanted . . . Bridge Superintendent to take complete charge of bridge and foundation work for long established New England contracting firm operating in New York and New England. Salary commensurate with experience and ability. P-1980, Engineering News-Record.

City Engineer—Lewiston, Idaho. (pop. 13,000) invites applications for registered civil engineer for position of city engineer, superintendent of streets and waterworks. Desire man with supervisory and administrative ability, experienced in street, sewer construction and maintenance. Salary open. Apply to Mayor D. K. Worden, 307 St. John's Way, Lewiston, Idaho.

HIGHWAY ENGINEERS for work in New Jersey and New York

Designers, draftsmen, chiefs of party, specification writers — submit complete resume stating education, experience, salary desired and date of availability to

P-1603 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

CIVIL AND SANITARY ENGINEERS

Civil Engineer for complete supervision of sanitary sewer and water supply for rapidly developing area. Excellent opportunity and salary. Also two experienced sanitary engineers to work with above as assistants. Please state full qualifications, experience, references

P-2025, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

Construction Mgr. for expanding gen. contractors office. Grad. CE. Minimum 10 yrs. experience. Labor following necessary. Send resume; state salary. P-1949, Engineering News-Record.

Engineer Estimator with foreman and superintendents experience on large and small sewer jobs. This is a small company; current gross $650,000. Personnel is competent and no junk equipment. Large but competitive market. Midwest location. Key job to man with proven ability. Salary, share of total profits, and voice in company affairs. State full experience and salary expected in first letter. P-2099, Engineering News-Record.

Instructor, Assistant or Associate Professor in electrical engineering. Master's degree, teaching experience desirable, not essential. Salary (9 Months) $4200-6800. New York State. P-2080, Engineering News-Record.

Wanted: Civil Engineer experienced in Municipal Engineering. Liberal benefits, including Annual wage increase, paid vacations, sick leave, retirement plan and social security, group life insurance, sick and hospital benefits. Contact Superintendent Public Works, City of Keene, New Hampshire.

Sales Manager for steel buildings. Requirements are: young, aggressive, engineering training, experienced in establishing dealerships and selling building products. Send resume in confidence to Mr. B. P. McDonough, The Parkersburg Rig and Reel Company, P. O. Box 1160, Parkersburg, West Virginia.

(Continued on opposite page)

When Writing Your Ad

Provide an indexing or subject word.
Write it as the first word of your ad.
If it is a Position Wanted or Position Vacant ad, make the first word the kind of position sought or offered.
This will assure proper classification in the column.
The right is reserved to reject, revise or properly classify all Want Advertisements.

Proper Classification increases the possibility of Prompt Returns

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work

Civil Service Opportunities
Selling Opportunities Wanted
Selling Opportunities Offered

Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED —RATES— **UNDISPLAYED**

The advertising rate is $28.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

$2.10 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box Numbers—counts as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36, N. Y.

POSITIONS VACANT

(Continued from opposite page)

Estimator—to make quantity take-offs, pre-pare detailed preliminary and contract cost estimates for building and engineering construction of industrial type. Must be experienced and conversant with prevailing costs, preferably in Middle Atlantic Area. In reply provide detailed information, previous experience, and give references. Also, state salary and when available. Clark, Buhr & Nexsen, Architects & Engineers, P. O. Box 9628, Norfolk, Virginia.

Bridge construction superintendent wanted for work in Florida. Submit experience record, qualifications, wages desired, references, etc. Must be experienced in all phases of referenced contracting and steel bridge construction. P-2148, Engineering News-Record.

Engineering graduates with experience in the testing and control of placement of soils, concrete or asphalt mixtures for work immediately abroad and in New England for an old established engineering organization. Give full details of experience and education. Salary range $5,000. to $10,000. per year. P-2147, Engineering News-Record.

Young graduate civil engineer with two years or more experience in building design or construction with liking and aptitude for structural design and analysis. Position with National Association in concrete products field, Chicago Headquarters. Excellent opportunity in growing organization and industry. Please furnish complete resume, including salary desired, in first letter. P-2158, Engineering News-Record.

Assistant Professor—To teach undergraduate courses in structures and applied mechanics. Salary depends on qualifications of applicant. Department of Civil Engineering, University of North Dakota, Grand Forks, N. Dak.

2 Graduate Civil Engineers: Must be capable of handling both Field and Office work in connection with design and construction of Sewers and Water Mains for municipally operated utilities, also, in connection with paving design and construction. 2 Engineering Aids: Excellent opportunity for undergraduate engineers to work with field parties and perform office work in connection with all phases of Municipal Engineering. All Salaries Open. Other benefits: Liberal Retirement Plan, sick leave, holiday and vacations. Excellent opportunities for advancement in rapidly expanding Department. Apply to: Gerald J. Lonergan, Personnel Officer, 26 Market Street, Mount Clemens, Michigan.

Civil Engineer with executive ability. Will get experience in all phases of engineering. Age 30-40. Opportunity for capable and ambitious man. Salary open. Write: P-2060, Engineering News-Record.

Mechanical and Piping Detailer for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1715, Engineering News-Record.

POSITIONS WANTED

Executive Engineer—Designer—Draftsman— Arrangements intimately acquainted with several trades. Lic. Eng'r. in State of New York. Originally qualified as journeyman in 5 trades. Very cost conscious and reliable. Prefer Grand Central area. PW-1956, Engineering News-Record.

(Continued on page 94)

ENGINEERS

Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical, and foundation engineers for interesting work on large dams, powerplants, river control works and highways. Permanent positions. Liberal employe benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

HARZA ENGINEERING COMPANY
400 W. Madison St.
Chicago 6, Ill.

ENGINEER

(CIVIL—OVERSEAS)
HIGHWAY MATERIALS and TESTING ENGINEER

Position: In charge of modern highway testing laboratory and materials survey in Near East.

Requirements: 15-20 years experience. Ability to organize and direct a country wide materials survey and train personnel in testing operations.

Top salary—good living conditions—liberal benefits including paid transportation for wife.

P-1812, Engineering News-Record
330 West 42 St., New York 36, N. Y.

ARCHITECTURAL ENGINEER

The ENGINEERING & CONSTRUCTION DEPARTMENT of a large East Coast Oil Co. needs an engineer to supervise architectural and building work in its central design division. Work experience should include a background of structural design, plumbing, heating and ventilating and other mechanical and electrical services, as well as the development of architectural design of industrial buildings and structures. If you are now working for less than $10,000 and are ready to move up, send your resume, in complete confidence.

E. T. ADDISON
P. O. BOX 7258
Phila. 1, Pa.

CIVIL ENGINEER

EXCELLENT EXPERIENCE afforded by Maryland Dept. of Public Improvements for graduate civil engineer with one year's experience. Salary scale $4265-5115 a year. (Increase of $260 on or after Oct. 1). For information and application contact Comm. of Personnel, 31 Light St., Balto. 2, Md. IMMEDIATELY.

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in middle Atlantic states. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive starting salary with company car, expenses and bonus plan.

P-8324, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

STRUCTURAL ENGINEERS DESIGNERS DRAFTSMEN

Prefer several years' experience in bridges, buildings, highway structures or hydro structures. Will consider lesser experience with good educational background.

We are professional engineers and desire men who wish long range employment with good opportunity to advance and develop in professional engineering. Occasional openings in construction supervision and inspection.

Paid vacation, sick leave, holidays, overtime. Employee Benefits Plan furnishes retirement income and insurance, Blue Cross. Moving allowance. Openings available in St. Louis and San Francisco.

Please write fully to

SVERDRUP & PARCEL, INC.
Engineers - Architects
915 Olive St. Louis 1, Mo.

AUTOMOTIVE ENGINEER

Graduate M.E. with minimum 5 years' experience involving design, selection or preparation of specifications for the construction and use of heavy, medium and light off-road automotive equipment. For work in Company's Equipment Engineering Department. Will prepare specifications for manufacture, economic and engineering analysis for selection and guidance for tests and inspection of purchased equipment. Salary commensurate with qualifications.

Write outlining personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 132

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

BECHTEL

ENGINEERS
DESIGNERS
DRAFTSMEN

Immediate openings in our

SAN FRANCISCO

and

LOS ANGELES

OFFICES

In The

MECHANICAL
ELECTRICAL
CHEMICAL
STRUCTURAL
PIPING
CIVIL

Fields of

Hydro-Electric
Steam Power
Sub-Station
Petroleum Refineries
Petro-Chemical
Chemical

Design

Engineers, Designers, and Draftsmen having qualifying experience in one or more of the above fields, please submit complete resume listing education, experience, salary history, present salary requirement, and availability date to:

5 West 45th St. New York 36, N. Y.
220 Bush St., San Francisco 4, Calif.

Confidential interview can also be obtained at: Scanlon Building, Houston, Texas, or Roosevelt Building, Los Angeles, Calif.

BECHTEL

Engineers - Constructors

ENGINEERS—DESIGNERS—DETAILERS
for work on
BRIDGES AND HIGHWAYS

Permanent Positions for Experienced Men and New Graduates in our CINCINNATI, OHIO, and LANSING, MICHIGAN, Offices.

Paid vacations and holidays, insurance and retirement plan.

Please give detailed personal and experience record, references and salary expected in application letter.

Hazelet & Erdal, Consulting Engineers
Dixie Terminal Bldg.
Cincinnati 2, Ohio

Design Engineers
Design Draftsmen

If you want

- HIGHEST EARNINGS
- OVERTIME WORK
- PERMANENT EMPLOYMENT
- OPPORTUNITY TO ADVANCE
- IDEAL WORKING CONDITIONS
- AIR-CONDITIONED OFFICES
- MANY OTHER BENEFITS

Please be sure to contact or see

Arthur G. McKee & Co.
with Engineering Offices in
CLEVELAND, OHIO and UNION, N. J.

McKee is a 50-year-old Engineering and Construction firm doing business on a world-wide basis.

Interesting, well-paying positions for

DESIGNERS, ENGINEERS, DESIGN DRAFTSMEN and DRAFTSMEN qualified in

PIPING	PRESSURE VESSELS
CONCRETE	EQUIPMENT SPECS.
STRUCTURAL	ARCHITECTURAL
ELECTRICAL	MECHANICAL

Refinery, Chemical, Blast Furnace, Steel and Sintering Plant, Industrial or Office Building design or drafting experience desirable but not necessary.

The expanding McKee organization, with three engineering divisions, Refinery, Metals and Industrial, offers many interesting opportunities in these highly-paid fields.

Investigate the opportunities McKee can offer you. If you want complete information write for our free booklet "Your Future in Engineering".

Please see or contact:
Edward A. Kolner

Arthur G. McKee & Company
2300 Chester Avenue • Cleveland 1, Ohio
TOwer 1-2300

INDUSTRIAL ENGINEERS

College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

Write, giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 93

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

Wanted—CIVIL ENGINEERS

Experienced in Municipal Engineering: Principal Civil Engineer, Senior Engineer, 3 Civil Engineers. Liberal benefits including annual wage increase, Longevity, Paid Vacation, Sick Leave, Retirement Plan with Social Security, Group Life Insurance, Sick and Hospital benefits.

Contact Superintendent of Public Works
Ann Arbor, Michigan

PAY DIRT IS UP...

for engineers and draftsmen at Dresser-Ideco Company. Here, some of the world's tallest structures are being engineered and . . . like many Dresser-Ideco super-tall TV antenna towers . . . opportunities for Dresser-Ideco engineers and draftsmen are climbing, too. There may be a place for you on the Company's rapidly expanding engineering team with the potential for rapid advancement into management and development responsibilities.

WRITE:
E. L. SMITH

Dresser-Ideco Company
One of the Dresser Industries
875 Michigan Avenue
Columbus, Ohio

SANITARY
HIGHWAY
ARCHITECTURAL

DESIGNERS and DRAFTSMEN

Regular Staff Position
Depending on Experience and Ability

CHAS. W. COLE & SON
220 W. LaSalle Ave., South Bend, Indiana

Civil Engineers

Expanding general construction firm wants civil engineers under 35 years of age with building construction experience to undertake training for permanent positions as estimators. Firm operates throughout New York State. Please give full resume, strictly confidential.

John W. Rouse Construction Corp.
8 Church St., Gouverneur, New York

CIVIL ENGINEERS

Grade III up to $8061; Grade II up to $6849. Municipal work in the design of streets, sewers, and sanitary installations. Opportunity to gain valuable experience. Some field check in following designs through to completion. Immediate vacancies for seven men. Exceptional fringe and pension benefits. Write to Department of Personnel, City Hall, Dearborn, Michigan, submitting qualifications and expected salary.

WHEN

Answering Advertisements

PLEASE *do not send original letters, certificates or photographs. We cannot be responsible for their return. Please send photostat or carbon copies.*

DRAFTSMEN

(Architectural Metal)

Experienced in making and checking shop drawings

Our company offers excellent opportunity in permanent non-defense work.

Live in beautiful Minnesota, Land of Lakes, Fishing, Hunting, and many Sports Activities.

Top wages, plus overtime, free liberal insurance, hospital and surgical benefits and pension plan.

Write S. Thom

THE FLOUR CITY ORNAMENTAL IRON CO.
2637 27th Ave. South
Minneapolis 6, Minn., U.S.A.

If qualified, travel and moving expenses will be paid.

HIGHWAY ENGINEERS
DESIGNERS
DRAFTSMEN
Drainage Engineers

FOR OFFICE WORK IN ST. LOUIS ON HIGHWAYS EXPRESSWAYS AND ASSOCIATED CIVIL WORKS

- ***Permanent employment for qualified men***
- ***Ample opportunity for advancement based on merit***
- ***Generous transportation & moving allowances***

Plus: Employee Benefit and Retirement Plan, Paid Vacations, Holidays, Sick Leave. Blue Cross available.

PLEASE WRITE FULLY TO OR INQUIRE AT

SVERDRUP & PARCEL ENGINEERING CO.
1134 LOCUST ST. ST. LOUIS 1, MO.

Engineers Architects

Highway—Bridge Designers—Draftsmen
Soils Engineer
Irrigation Designer
Construction Engineer (Irrigation)
Architectural Designers—Draftsmen
Ink Tracers—Computors
Civil Engineering Draftsmen

Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., Inc.
BAKER BLDG. ***Consulting Engineers*** **ROCHESTER, PA.**

REFINERY ENGINEERS

CALTEX has openings for JR and SR Engineers in the following fields:

- Application and Development of Petroleum Products.
- Process Design Work related to Refinery Process Equipment
- Refinery Technical Service

Candidates should meet the following requirements:

- Bachelor's or Master's degree in Chemical or Mechanical Engineering from a recognized college or university.
- Interest in possibility of future overseas service.

Salary commensurate with background and experience. Liberal employee benefits.

Send detailed resume to:

CALIFORNIA TEXAS OIL COMPANY, LTD.
380 MADISON AVENUE
NEW YORK 17, NEW YORK

c/o Personnel Dept.

SALES ENGINEER CONSTRUCTION EQUIPMENT

Opportunity for sales engineering work for energetic young engineer or construction man. 25 to 35 years of age for sales work in established territory with company operating on nation-wide basis furnishing metal forms for sale or rent to handle concrete forming work. General construction experience or some civil engineering training desirable. Give full details of background and experience in first letter to:

R. P. Wilkinson,
Economy Forms Corporation
P. O. Box 128, H. P. Station
Des Moines, Iowa

CIVIL ENGINEERS SURVEYORS AND DESIGNERS

Experienced rodmen, chainmen, instrumentmen, designers and draftsmen for permanent highway work. Considerable choice of location in Washington State. Good opportunity for advancement. Progressive, non-political merit system. Minimum of 12 working days each of vacation and sick leave per year. Retirement system. Five step automatic increase wage schedule. Minimum entrance salaries $320 for rodmen and chainmen and $380 for instrumentmen; higher starting salary possible depending on experience and/or education. Also can use recent C. E. graduates or experienced designers for bridge design work in Olympia. Some openings for highway construction inspectors, soils men, planning and traffic engineers and drill rig supervisors. Write for application blank to:

WM. T. READ, Personnel Officer,
Washington State Highway Department,
Transportation Building, Olympia, Washington.
State preference of location and type of work in your letter.

Construction ENGINEERS

FOREIGN EMPLOYMENT

Graduate Electrical, Mechanical, Civil or Chemical Engineers with minimum 10 years' experience supervising construction of industrial buildings, oil processing and oil handling facilities. Engineering degree essential. To assist in constructing expanding company facilities of major foreign operating oil company located in Saudi Arabia. Generous salary plus living allowance: liberal all-inclusive benefit program.

Write giving full particulars regarding personal history and work experience.

Recruiting Supervisor, Box 146

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

POSITIONS WANTED

(Continued from page 91)

Structural Engineer, licensed graduate, 30 years diversified design, and construction experience in subways, waterfronts, chemical plants, power plants, etc., available for responsible position. PW-1930, Engineering News-Record.

Construction Executive 28 years experience in all phases of heavy and industrial construction, power plants, chemical plants, refinery installations, buildings, locks, dams and tunnels, interested in connection with aggressive contractor in west or northwest doing lump sum contracts and promotional sales work. Estimating and pricing accurate, and construction methods current. Primary education M.E. Desirous of participating arrangement. PW-1992, Engineering News-Record.

Construction Engineer, 31 BSME 4 yrs. experience. Field Engr. and assist. supt. on industrial and institutional bldgs. Relocate to West Coast or overseas with wife (teacher & secretary.). PW-2108, Engineering News-Record.

Construction Engineer-34, C.E. graduate, 8 years field & office experience on power plants & bridges for contractor & owner. Desire permanent position West Coast area. PW-2085, Engineering News-Record.

Estimator, 27, BSCE—experience field work 2 yr., estimating paving, sewers, water, gas, electric, telephone over 3 yr. Structural major. Presently $600/mo. Go anywhere w/family. PW-2055, Engineering News-Record.

Quarry superintendent. Specialize in rock excavation. Long experience in all classes of rock. Fluent Spanish and English. Will go anywhere. PW-2131, Engineering News-Record.

Construction Superintendent, experienced with refineries, chemical plants, all types of heavy construction, good estimator and cost engineer, either engineering or detailed estimates, available soon. Age 47, speaks, reads and writes Spanish, Latin American experience, location unimportant, have good following. Prefer chemical plant or mill and smelter, comprehensive all crafts. PW-2142, Engineering News-Record.

Structural Steel Erection, B.S.C.E., 28, 6 years experience in field and office on bridges, buildings, and industrial maintenance. Engineering, supervision of fieldwork, estimating and pricing, management. PW-2148, Enginering News-Record.

Superintendent, 19 years heavy construction experience, including Government and State projects. Salary $200. PW-2150, Engineering News-Record.

General Superintendent—Expert Methods Man, presently with large Western Engineer Contractor, as Member of the Board and General Superintendent of Operations. Wants change for personal reasons. 41 years old. From Denver, Colorado, West. Will consider smaller company, if they are ambitious. PW-2154, Engineering News-Record.

Structural Engineer, 32 years building, waterworks, bridge design experience. licensed, college graduate, Metropolitan New ork. PW-2170, Engineering News-Record.

Position Wanted, Construction superintendent age 48 twenty five years experience on bridges, roads and heavy work, clean record, graduate engineer, available thirty days, now completing large bridge project, address PW-2167, Engineering News-Record.

Executive, Heavy Construction 18 years experience in all phases, bid to completion. Manage project or business. Salary $14,000. PW-2166, Engineering News-Record.

Sewer Foreman, broad experience, capable to handle satisfactorily the most intricate sewer job for the contractor who seeks profitable results without constant personal guidance. Middle Atlantic area. PW-2127, Engineering News-Record.

WORK WANTED

Recently formed partnership of Architects and Engineers wishes to associate with organization to do some of its overload work. Principals are registered and are available for work East Coast and Mid-West. WW-2165, Engineering News-Record.

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES — EQUIPMENT - USED or RESALE

UNDISPLAYED —RATES— **DISPLAYED**

$2.10 a line, minimum 3 lines. 6 figure advance payment count 5 average words as a line.

BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

The advertising rate is $23.60 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW ADVERTISEMENTS or Inquiries to Classified Advertising Div. of Engineering News-Record, P. O. Box 12, N. Y. 36, N. Y.

Attention Landscapers

TOBACCO CLOTH NETTING

for erosion control, newly seeded lawns, embankments, berry bush and tree coverings.

800 square feet..... $3.00

Special discount on large orders

We will ship, carrying charges collect, by most economical means.

Order now.

Send check or money order.

ACME BURLAP BAG Co.

539-T Windsor Street,

Hartford 1, Connecticut

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.

Send post card for details.

GEO. E. DEATHERAGE & SON

CONSTRUCTION CONSULTANTS

P.O. Box 921 Lake Worth, Florida

WANTED

VULCAN NO. 1

PILE DRIVING HAMMER

IN A-1 CONDITION

A. S. WIKSTROM, INC.

Skaneateles, N. Y.

WANTED

2—Buffalo Springfield Tandem Rollers, Model KT-24, Serial No. 27000 series and up.

1—Buffalo Springfield 6 axle Tandem Roller, Model KX-25E.

1—Blaw-Knox Bituminous Paver, Model PF-90.

A. & J. BUYERS, INC.

3580 Sheridan Drive Buffalo 21, N. Y.

Phone—PA. 4400

DIESEL GENERATORS

3—Fairbanks Morse Engines and Alternators KVA 510, KVA 300, and KVA 170

1—Winton Model 8/1580 direct connected to an E.M. Alternator 606 KVA

All of the above 480 volts 3 phase 60 cycle. In excellent operating condition. Can be seen running.

Facilities available for re-installing if desired.

A-1 Iron and Metal Company

10010, South Alameda Street

South Gate, California

P.O. Box 511 Phone LOrain 6-6196

Contact: Fredrick Riley

FOR SALE

DERRICK CAR

Capacity 50 tons at 40 ft.—70' boom.

LOCOMOTIVE CRANE

Capacity 40 tons at 12 ft.—steam powered. Industrial Brownhoist Model K.

LIST & WEATHERLY CONST. CO.

424 Nichols Road Kansas City, Mo.

WANTED

STIFFLEG DERRICK

75-100 TON

W-2171, Engineering News-Record

520 N. Michigan Ave., Chicago 11, Ill.

STRUCTURAL ENGINEERING

ARCHITECTURAL ENGINEERING

OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year.

Write today — without obligation

WILSON *Engineering Corp*

Fellows House Offices HARVARD SQ. CAMBRIDGE MASS.

FOR SALE—USED

LE TOURNEAU EQUIPMENT

2—Super C Tournapulls with 15 cu. yd. Scrapers

2—Tournadozers

3—B.33 Tournapulls with 35 cu. yd. Scrapers

Equipment in good working condition.

Over $100,000.00 inventory of spare parts. List can be furnished on request. Offers invited

J. N. HARRIMAN & CO. LTD.

P. O. Box 232, Port-of-Spain,

Trinidad, B.W.I.

NOTICE to ADVERTISERS

Because of the Holiday, Independence Day, July 4th, the "Searchlight" pages of the

JULY 5TH ISSUE OF

ENGINEERING NEWS-RECORD

Close for press earlier than the usual weekly closing time. The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

Display and Undisplayed Ads

FINAL CLOSING TIME

Friday, June 22nd

PROPOSALS Thursday, June 28th

FOR SALE or RENT

25 ton Ohio Diesel Loco. Crane. 1947.
30 ton Browning Diesel Loco. Crane. 1947
40 ton Ind. BH. Steam Loco. Crane. 1942.
25 ton American Stiffleg. 100' Bm.
30 ton American #2 Guy Derrick. 90' Bm.
140 HP 2D Diesel Hoists 15000# SLP.
110 HP Amer. 3D #100 Hoist w/ Swinger.
45 ton Davenport Diesel Elec. Loco. 1942.
65 ton Whitcomb Diesel Elec. Loco. 1945.
1½ yd. Northwest #6 Diesel Crane New 1948.
1½ yd. Bucyrus Erie 38B Diesel Crane. 1948.
60 ton Manitowoc 3900 Erection Crane. Rent.
100 HP Lucey Portable Boilers. 200# WP.

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St. St. Louis 1, Mo.

FORSYTHE EQUIPMENT CO., INC.

MANITOWOC SPEEDCRANES

RENTALS

Capacities to 70 Tons
Booms to 140 ft. and 30 ft. jibs.
Special rates on long rentals

Exeter 2-6125 37-11 Vernon Blvd.
Long Island City 1, New York

EUCLID TWIN POWER SCRAPERS

3—Model 16 TDT-218H With Fully Enclosed Cabs, Lights, Heaters And Defrosters

EXCELLENT CONDITION

Hours Operated - 450 - 4000 - 4300

STANDARD EQUIPMENT CO.
340 PIERCE ST., KINGSTON, PA.
Phone BUtler 8-1426

PUMPCRETE—FOR SALE

200D Pumpcrete with 400 ft. 8" Pipe
Excellent Condition — Chicago Area

SPENCER, WHITE AND PRENTIS, INC.
10 East 40th St. New York, N. Y.
Murray Hill 9-1530

USED TRUCK MIXERS

2 Rex 5½ Adjusta-Hite Moto Mixers
1 Gorham Rupp 4-in. water cooled Pump, Model 14A powered by Hercules 1XB engine.

POWERED EQUIPMENT CORP.
Authorized Rex Distributors
130 Needham St., Newton Highlands, Mass.
LA 7-5450
Providence, REgent 7-7702, 2996

---

32 MARION—Rated 1½ Yards
Built to ship by mail

56'6" Boom	$15,000.00
No. 1 VULCAN HAMMER	2,500.00
85' STEEL PILE LEADS	1,000.00

Located —Tampa, Florida

WESTERN FOUNDATION CORPORATION
2 Park Avenue New York 16, N. Y.
Murray Hill 9-6441

New & Unused **HEAVY DUTY INDUSTRIAL MODEL**

AXIAL FLOW FANS

Manufactured by the DELCO DIVISION of GENERAL MOTORS

offered at 50% of General Motors Delco Price!

HEAVY DUTY INDUSTRIAL MODEL
ENCLOSED WEATHER PROOF MOTOR
CAST ALUMINUM ALLOY
CONSTRUCTION THROUGHOUT

For the Control of

- FUMES • STEAM • ODORS • DUST • VENTILATION
- COOLING OF WORK IN PROCESS • CROP DRYING
- INDUSTRIAL VENTING • PERSONNEL COOLING
- FORCED COOLING OF ELECTRICAL EQUIPMENT

Standard model, mounted in framing unit, ready to install in sash, building opening or duct system. Frame designed for ready attachment of louvre, duct or hood.

16,500 C.F.M. ½" STATIC PRESSURE (18,500 C.F.M. FREE DELIVERY)

• STEEL & NON FERROUS METAL WORKING PLANTS • CHEMICAL PLANTS
• FOUNDRIES • POWER PLANTS • CROP DRYING • MACHINE SHOPS • MILLS—MINES
• FABRICATING & WELDING SHOPS • FOOD PROCESSORS • ELECTROPLATERS

Model #1—1791Y framed Unit—4 H.P.—220 Volt—60 Cycle Single Phase—1200 RPM
#1—1450Y Unframed Unit—4 H.P.—220 Volt—60 Cycle Single Phase—1200 RPM

Framed Fan—Mounting Frame Outside Dimensions:
45⅛" x 45⅛" x 11-9/16"—Wt. 484 lbs.

Unframed Fan
39" diameter bolt circle—40¼" over-all diameter—11¾" over-all width—Wt. 400 lbs.

Suitable for either Horizontal or Vertical Mounting. May be used either as blower or exhauster.
Installation information, complete maintenance, operation and instruction manual with each fan.

ORIGINAL SELLING PRICE $545 each
OUR PRICE 1-5 $275 EACH
6 OR MORE $250 EACH F.O.B. Reading, Pa.
Unframed model—deduct $10.00

MAY WE SHIP YOU A SAMPLE ORDER ?

INDUSTRIAL EQUIPMENT DIVISION OF
LURIA BROTHERS & COMPANY, INC.
PHILADELPHIA NATIONAL BANK BLDG.—PHILADELPHIA 7, PA. • Rittenhouse 6-7455

AGSCO ENGINEERED DIESEL POWER

STATIONARY—PORTABLE—MOBILE & MARINE
New and Remanufactured
100 to 2000 HP . . . 60 to 1500 KW
New Parts For All Engines
Write for Brochure

A. G. SCHOONMAKER CO., INC. Main Office—Sausalito, Calif., Sausalito 1600 Branch—50 Church St., N. Y. 7, N. Y., Digby 9-4350

FOR SALE

DIESEL ELECTRIC LOCOMOTIVES

STANDARD GAUGE

25 - 35 - 40 - 50 - 65 - 75 - 100 tons

Write for Details

FRANK M. JUDGE & CO., INC.
7010 Empire State Building
New York 1, N. Y.

NEW AND REBUILT
STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton — 18" to 56" Track Gauge

GREENSBURG MACHINE CO.
Greensburg, Pennsylvania

FOR SALE

Save On Good Used

WOOD ROADMIXERS

1—Model 42

2—Model 54

1—Cement Bulker for Cement Stabilization

1—Cement Transfer Screw

CLYDE W. WOOD & SONS, INC.
P. O. Box 620
North Hollywood, Calif.

YOUR OPPORTUNITY!

UNUSED Army Trucks
2½, 3½, 5-ton

GMC-DIAMOND T & INTERNATIONAL 6x6's

- *From Government Storage!*
- *Unused and Guaranteed!*
- *Factory-New Condition!*
- *Delivered on Approval!*
- *Reconditioned Trucks Also Available!*

Tandem axle trucks with front wheel drive, 10 forward speeds, overdrive, brand-new mud and snow tires. Carry maximum loads, give extra power you need in "rough going" . . . at LESS, often half the COST of conventional new trucks.

For Specifications, Prices, Delivery:
Phone Collect
MILTON Y. TOOMBS, Jr.
Sales Manager

MEMPHIS EQUIPMENT Company
CONSTRUCTION AND AUTOMOTIVE EQUIPMENT AND PARTS
766 SO. THIRD ST. MEMPHIS, TENNESSEE

EQUIPMENT FOR SALE

3—15-18 yd. Wooldridge Scrapers, 1953 model OS-152

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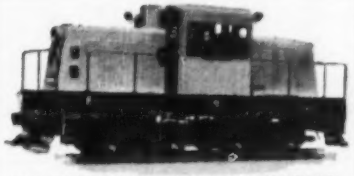

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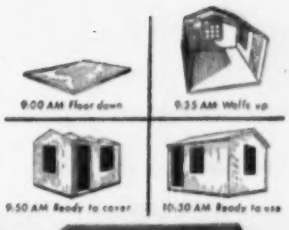

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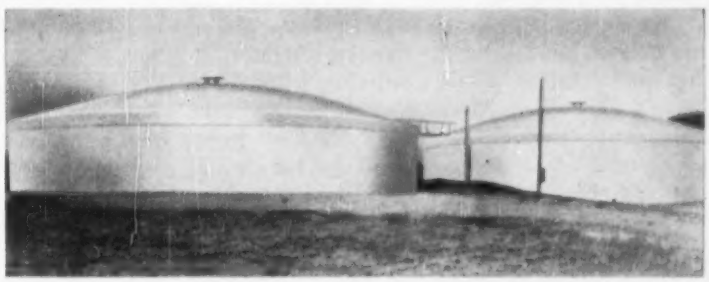

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Factories of the Future

REPORTS FOR THE FIRST HALF of the year make clear the extent of the current boom in industrial building. Contract awards are 130% ahead of last year and, if the second half of 1956 is a duplicate, the total will be 35% greater than the record established in 1955.

The really significant aspect of the boom, however, is the character of the buildings being produced; for this boom fortunately comes at a time when designers are ready with many new ideas to make these factories better and more efficient than even the best of the older models. Moreover, the improvements will be evident across the board—in structural framing, enclosure, lighting, noise control, heating, air conditioning, electrical distribution and other utilities. And because they hold so much promise for the factory of the future and the construction industry which must provide it, a special report on the nature and impact of the improvements will be a feature of next week's issue.

Basic Facts on Heliports

PLANNING FOR HELICOPTER SERVICE between Manhattan Island and the big airports serving the New York region appears to be getting down to earth after being up in the clouds for a long time. This is highly desirable because not enough practical thinking has been applied to the difficult problem of determining whether helicopters can be used to make a worthwhile reduction in the time lost in travel between home or hotel and the airports serving large cities. What New York learns about the possibilities and cost of service between its airports and the recently approved heliport along the Hudson River at 30th Street on the West side of Manhattan Island should be a useful guide for other cities.

When the 30th Street heliport is ready for operation late this year, it will be made a stop for helicopters now operated between Newark Airport and La Guardia Field by New York Airways, Inc., which now runs one trip each way every hour with five-passenger Sikorsky S-55's. By the time that service to Manhattan starts, the operators hope to have 12-passenger S-58's in use, and plan to cut the trip spacing to every 45 minutes. The cost will be about 50 cents a seat-mile as compared to 80 cents at present.

For profitable, unsubsidized operation, according to Robert L. Cummings, Jr., president of New York Airways, the seat-mile cost should be cut to around 10 cents. That means bigger helicopters, which in turn means that the manufacturers have to be shown that there is a market for such equipment.

One 12-passenger helicopter each way every 45 minutes, even if operated 24 hours a day—which does not appear practical—is a long way from the million passengers a year visualized by the Port Authority as using that facility within ten years (ENR May 3, p. 27). Yet such a regular service will demonstrate whether there is a demand for that type of transportation to a point on Manhattan Island, but which still requires a tedious taxi ride to reach most of the hotels and office buildings of midtown New York. Also, much will be learned as to the capacity of the heliport now being built and of the area that must be provided for greater capacity, if the demand for this limited service indicates that other and larger heliports should be built. The latter information will be of value to planners in all large cities.

Lesson From a Tragedy

THE DEATH OF SIX CHILDREN in the cave-in of a Brooklyn construction excavation June 12 points a moral for construction men: Any construction job is an attraction to children, and nothing less than the most meticulous safety precautions—particularly in a heavily populated metropolitan area—can be permitted.

Probably very few readers of this page can deny that as children they played in dangerous construction sites, sometimes with an eye cocked toward a watchman, and always against the sternest parental orders. The Brooklyn tragedy is being investigated, but regardless of what the investigators find, no contractor now dares confine his precautions only to the protection of his own property, with only a token gesture toward the general public. Granted that a really tight, reasonably boy-proof fence around a temporary site may be expensive, granted that a heavy complement of watchmen is also expensive, such expenses won't come within shouting distance of the cost in damages for such an accident as occurred in Brooklyn. More importantly, no amount of money will really cover the loss of six small lives.

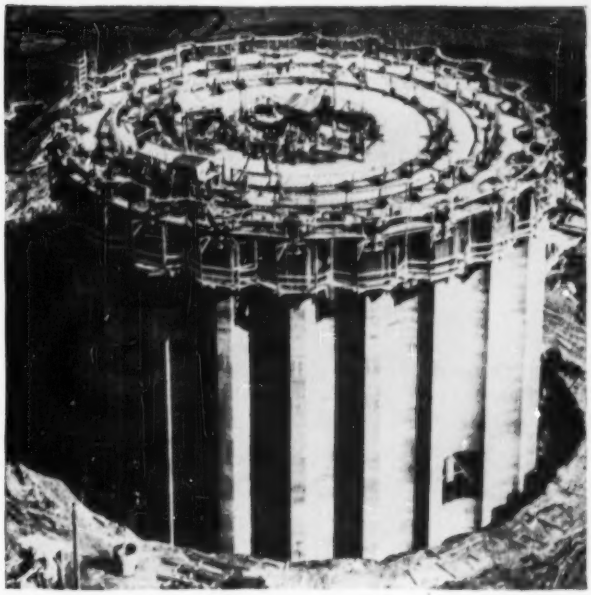
It must also be admitted that no damage payment can erase the black mark against the construction industry imprinted by such a tragedy.

The truth is that the black mark is deserved in many cases. It is too easy to walk around any major city and see violation after violation, carelessness compounded, on one construction job after another. Protective fences are badly built, workmen are allowed to get away with unsafe hitches on material being lifted, machinery and equipment is left temptingly in condition and places where mischievous hands can get at it, watchmen are ill-trained and often poorly paid.

No contractor, no engineer, no city official, no insurance inspector can afford to let these practices continue. Self-policing—both from a financial and a human viewpoint—must be enforced by the industry. A general public, aroused by such an accident, can insist on regulation so drastic as to raise costs and lower efficiency far beyond what reasonable safety measures would entail.

LARGEST TANK OF ITS TYPE...

City of Dallas, Texas 2,000,000-gallon prestressed concrete water tank. Supported on reinforced concrete slab resting on four concentric ring walls. Substructure walls built simultaneously with slip forms using hydraulic jack system. Pozzolith employed in the concrete. Design: The Preload Co., Inc., New York City; Prime Contractor: Whittle Construction Co., Dallas. Sub-contractor for prestressing: Preload Construction Corp.



Left: View of the four tower cylinders under construction, with slip-form platform at top.

Right: Wire-winding machine wraps finished tank in pre-stressing operation.

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This giant water tank is one of many slip-form projects in which Pozzolith was used because it provides three controls required for optimum concrete performance in this type of construction. These controls are:

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BLOOMINGTON, Ind., paved this street with Texaco 39 years ago.

KANSAS CITY, Mo., constructed this Texaco-paved street 45 years ago.

WICHITA, Kan., laid this Texaco Asphalt pavement 37 years ago.

LAKE FOREST, Ill., paved this street with Texaco 43 years ago.

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